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The PHOTOFACT Servicer

February 15, 1950 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Vol. 9, Nos. 85 & 86

SOLD! TWO MILLION

The other day, Don Shaw (Author, "How Much Is Your Labor Worth?"), our Treasurer, stopped in my office to say: "Do you know that over two million sets of PHOTOFACT Folders have been sold?"

When I was a youngster, my Dad used to tell me, "A million of anything is a lot." It was many years before I knew the meaning of that sentence. We have tried really hard to produce a product that would reflect its merit in continuing and increasing sales. You continually tell us how helpful PHOTOFACT Folders are, but, along with your praise you are friendly enough to tell us when we make mistakes. I sincerely believe that the test of true friendship lies in the candidness that reflects the relationship we have with you. If, on occasion, what we write seems to be patting ourselves on the back, please overlook it. We have only one objective and that is to help you - to give you what you want and need, at the lowest possible cost.

Speaking of costs - ours have trebled since we started in business, but in spite of that, we think we have turned out a product that has constantly been improved and that today is so much better than the first PHOTOFACT we produced, there actually is no comparison. A year from now, we pledge that PHOTOFACTS of that time will be infinitely better than those we produce today. So in announcing that our sales have exceeded the two million mark, there is a huge hunk of gratitude to you for the part you have played in making this phenominal record possible.

* * *

WON'T YOU COME TO SEE US?

Every regular PHOTOFACT subscriber has a cordial standing invitation to visit us and see for himself how we do our work. Our new home is our pride and joy.

In the basement are back sets of PHOTOFACT Folders, our raw paper stock and the inventory of other publications; files, the employees' recreation room and our heating plant.

The first floor is devoted to general offices, sales and accounting, our entire analytical engineering group, art department and our receiving and shipping room.

The second floor contains presses and the space where the collating (that means putting together) and binding work is done. PHOTOFACT Folders are also packed and made ready for shipment in this section. The 30,000 square feet of floor space that is occupied is a beehive of activity.

Visitors never fail to express surprise at all of the things we do. Our services are used by every segment of our industry. We urge all of you to think of us as truly representing our industry. Never forget that 20 participating replacement parts and tube manufacturers help to bring you the service you receive, thereby making it possible to sell PHOTOFACTS at their outstanding low cost.

We hope never to be so big that we cannot find time to remember that it is you we are here to serve primarily. We are always conscious of our obligation to you to provide you with the finest and best service at the lowest possible cost.

Come and see us - meet the gang - - you will always be welcome.

* * *

FIRST COME, FIRST SERVED!

The response to our offer of free Door Knob Hangers as a Christmas present (see Servicer, Set No. 80) was way beyond our expectations.

There are still a few of these left and they are available on the basis of "first come - first served" - as long as our supply lasts - - FREE.

Be sure to use the coupon.

PHOTOFACT SCHEMATICS GIVE YOU MORE FOR YOUR MONEY

Our policy is to combine variations in chassis where they are relatively minor rather than to publish 10 or 11 large schematics each one slightly different.

All publications are priced on a per page basis analysis of their cost. We feel it is in your best interests to give you every bit of information in the least amount of space.

Any rehash of the same schematic, over and over again, means that YOU pay for the same information many times over at the cost of information on some other entirely different receiver.

We believe that minimizing the number of pages required to cover a receiver and still give correct and complete servicing information provides YOU with the best possible service.

YES, PHOTOFACT SCHEMATICS GIVE YOU MORE FOR YOUR MONEY.

* * *

NAME THEM - Please!

Francis C. Wolven, our faithful friend of Saugerties, New York, makes a practical suggestion that we hope you will accept. Here it is.

"Wouldn't it help if we fellows kept a list on a penny post card of sets serviced, but not listed in your Cumulative Index?

"The card could be mailed every week or so, or when it was full up. And they should prove helpful in assigning priority on models to be processed.

"I am sure many of us would cooperate."

You bet it would help, and I'd be more than grateful. So please - start right now to keep track. Mail the cards to Bill Renner, c/o Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, and I promise we will give you what you want when you want it.

It's a keen idea. Thanks, Francis.

* * *

WANT A COPY?

SYLVANIA have just released a 20 page 8-1/2 x 11 Television Tube Characteristics

Chart - that is a honey. It is full of helpful data that you will use often. You can get a copy FREE from your Sylvania Distributor or by writing Bill Browne, Sylvania Electric Products, Inc., Emporium, Penna. Mention the Photofact Servicer, please.

* * *

CORRECTION

Set 75, Folder 16 - is NOT a BATTERY LINE OPERATED receiver. Please delete these words. No one knows how this error happened.

* * *

AM/FM MODELS

On November 7th we had 24 AM/FM models in the analytical line. On January 16th this number had increased to 45.

Does that tell you anything?

* * *

FIELD EXPERIENCES:

For every "Field Experience" published we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or for the results obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

SENTINEL 400TV
Photofact Set No. 73, Folder No. 11

Complaint: Very weak sound and no picture. Raster and high voltage normal.

Remedy: R18, 82,000 ohm screen dropping resistor in 6AG5 mixer stage had increased its value. Replacement of the resistor (and its a tough one to get at) solved the problem.

Early Runs of MOTOROLA VT105
Photofact Set No. 67, Folder No. 13

Complaint: No raster.

Remedy: Replace shorted 6BG6 screen by-pass condenser.

MOTOROLA VT71
Photofact Set No. 55, Folder No. 16

Complaint: Channel switch and fine tuning control noisy.

Remedy: Examination showed that two small screws holding rotor plate of fine tuning condenser had fallen out letting the plate fall down. Reassemble condenser with new screws.

I also find on the VT71's that cutting several holes (for ventilation) in the plate under the chassis will help prevent component breakdown.

Also on MOTOROLA VT71

Complaint: Vibration would cause both sound and picture to disappear.

Remedy: Replace the oscillator tube, resolder the channel switch contacts and realign the oscillator trimmers for the channels being used.

Editor's Note: All four above Field Experiences were submitted by:

Gordon E. Hopper
Hopper's Radio and Television Shop
301 - 303 Hollis Street
Framingham, Mass.

* * *

ADMIRAL TV Chassis 19A1
Photofact Set No. 59, Folder No. 2

Complaint: Picture good. Sound distorted, giving every indication of a leaky coupling condenser. Signal comes out loud and clear when audio signal generator is used. Distortion is noticeable only when voice or music is present.

Cause: The grid resistor No. R48 (560K) connected between pin No. 2 and ground (6AS5 or V11, audio output) was found to be defective. With this resistor open, the voltage on pins Nos. 1, 2, and 5 will read 155, 150, and 150 volts instead of the normal 125, 120, and 120 volts.

Note: Resistor should be disconnected at one end to check, as it will show a reading when in the circuit.

Lloyd O. Brown
Boulevard Radio & Repair Shop
3107 Taylor Blvd.,
Louisville 8, Ky.

* * *

FORD 7070
Photofact Set No. 45, Folder No. 10

Complaint: Very low volume.

Remedy: The fixed capacitor in the same capacitor stack as the trimmer in the secondary of the output IF transformer shorts. To make it misleading, the secondary trimmer peaks. The .005 audio coupler to grid of the 7B6, lying next to the lead from IF can to diode, picks up just enough signal to give the low output. The trouble can be corrected by removing the transformer from the can and washing the condenser leaves with carbon tetrachloride. Incidentally, the value of the resistor inside the can is 33,000 ohms. This is not shown on the diagram.

Drury J. Burchett
Congress Heights Radio Service, Inc.,
3111 Nichols Ave., S. E.,
Washington 20, D. C.

* * *

SILVERTONE Model 8000
Photofact Set No. 31, Folder No. 29

Complaint: Low volume, grinding and frying noise over entire band.

Remedy: Replace 100 MMFD. mica AF plate by-pass condenser with a good 500 volt mica condenser. This condenser is Item No. 12 on the folder.

P. E. McGee
Moreland Ave. Radio Service
926 Moreland Ave., S. E.
Atlanta, Georgia

* * *

MOTOROLA Television Receiver
Model No. VT-71
Photofact Set No. 55, Folder No. 16

Complaint: Sound channel O. K. Picture intermittent, with blurred response, similar to an out-of-focus condition. Adjusting focus control does not clear up picture but does improve it

somewhat. At the same time the raster is intermittent, with the vertical oscillator apparently stopping. Intermittent condition continues over a long period of time.

Cause and Remedy: R-84 2.2 meg. Resistor open or very high resistance. Replace and the trouble is over.

Arthur E. Dibble
New Albany, Penn.

* * *

EMERSON Model 576
Radio Phono Combination
Photofact Set No. 40, Folder No. 5

Complaint: Intermittent or constant hum on phonograph only.

Cause and Remedy: This was traced in most cases to a poorly soldered ground connection on the phono switch (Item 2). In some instances this connection had been omitted leaving the phono "floating" with no isolation.

G. F. Early
Early Radio Servicer
Topeka, Kans.

* * *

ZENITH Model 8H832
Photofact Set No. 52, Folder No. 24

Complaint: When set is turned on there is a persistent hum the same as though there were an open filter. No reception from the receiver. Rectifier tube 5Y3 plates will heat red hot.

Cause: All usual methods for testing for this type of trouble fail. Failure of set is usually due to the primary of the output transformer being grounded to the core of same.

Remedy: Install new transformer.

H. T. Nicholas
Community Radio Service
Lutcher, La.

* * *

SILVERTONE Model 6011
Chassis 132.816A
Photofact Set No. 15, Folder No. 27

Complaint: Instability and motorboating at the low frequency end of the dial.

Cause: This set is supplied with GT type tubes, but the trouble could not be eliminated until a shield was placed on the 12SA7GT tube. Since the GT tube is the correct one listed for the set, I attempted to correct the trouble by other procedures such as an entirely new tube lineup, checking the filter capacitor and checking the voltage and resistance in accordance with the PHOTOFACT information. No check showed anything defective, and in no place could I find the source of the trouble. Every indication was that the 12SA7GT needed to be shielded. The trouble was eliminated when the shield was left in place or when a metal type 12SA7 tube was used.

Remedy: A metal tube was left in the receiver, and the set realigned. Since then, the set has been working perfectly with no recurrence of the trouble.

William C. Blake
130 Haymond Highway
Clarksburg, W. VA.

* * *

ZENITH Model 4G800Z
Photofact Set No. 52, Folder No. 23

Complaint: Set dead. Tubes O. K. Voltages normal. The lead to loop antenna in cover twisted off at the hinge pin to which it was soldered. Every time the cover is raised or lowered the wire is twisted.

Remedy: Solder both the leads to the parts of the hinges which fasten to the cabinet. This eliminates the twisting and finally the broken wires. (Clean the hinges with carbon tet so there will be good contact between the two parts of the hinge, and use switch contact dope as supplied by Walsco, or General Cement.

Ira P. Colby
One Hoover Street
Springfield, Vermont

* * *

SPARTON Model 7-46
Photofact Set No. 1, Folder No. 31

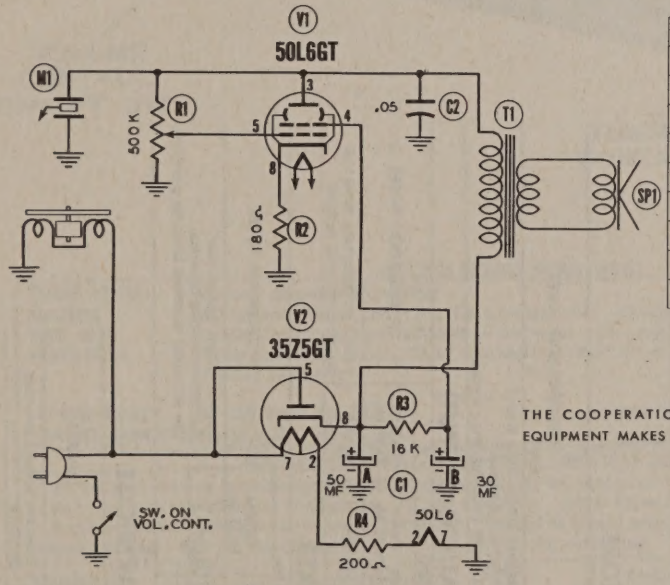
Cause: After careful check, grounding of one side of 6.3 volts filament to chassis was found defective. This is made at the 6F6 socket.

Remedy: Ran jumper to chassis and check rest of sockets.

Roy Brown
c/o Quincy Electric Co.,
P. O. Box 625
Quincy, Wash.

AIRCASTLE MODEL 101

TRADE NAME	Aircastle Model 101
SUPPLIER	Spiegel Inc. 1061 W. 35th St. , Chicago 9, Illinois
TYPE SET	AC Operated Phonograph with Two Tube Amplifier and Speaker
TUBES (TWO)	Types 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC
RATING	.290 Amp. at 117 Volts AC



Pin No.	50L6GT Volt.	50L6GT Res.	35Z5GT Volt.	35Z5GT Res.
1	0V.	Inf.	0V.	Inf.
2	50VAC	47Ω	80VAC	250Ω
3	120VDC	†110Ω	83VAC	260Ω
4	75VDC	†16KΩ	0V.	Inf.
5	0V.	500KΩ	117VAC	280Ω
6	0V.	Inf.	0V.	Inf.
7	0V.	0Ω	117VAC	280Ω
8	.2VDC	180Ω	130VDC	30KΩ

† MEASURED FROM PIN 8 OF V2.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

86-1

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Power Output	50L6GT	50L6GT	7AC	
V2	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	D503	PRS150/30-50	EDL5315		TA-530	Filter-Green
B	30	150						Filter-Red
C2	.05	400	D-54	P488-05	GT4S5		TM-15	Output Plate Bypass

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	VC-1	Q13-133	15/16-60-Z	Volume Control
B	Switch		Not Req.	76-1 ø	SPST SW #	

ø Attach to R1A per instructions
Attached at factory.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	180Ω	½	W-180	BW-½-180	Output Cathode-Wire Wound
R3	16KΩ	½	W-16		Filter-Wire Wound
R4	200Ω	10	W-20	AB-200	Filament Dropping-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2500Ω	3.5Ω	114Ω	.6Ω		A-3876 †	A-2928 †	RO-2 †	† Bend mounting tabs down and mount on original bracket.

SPEAKER

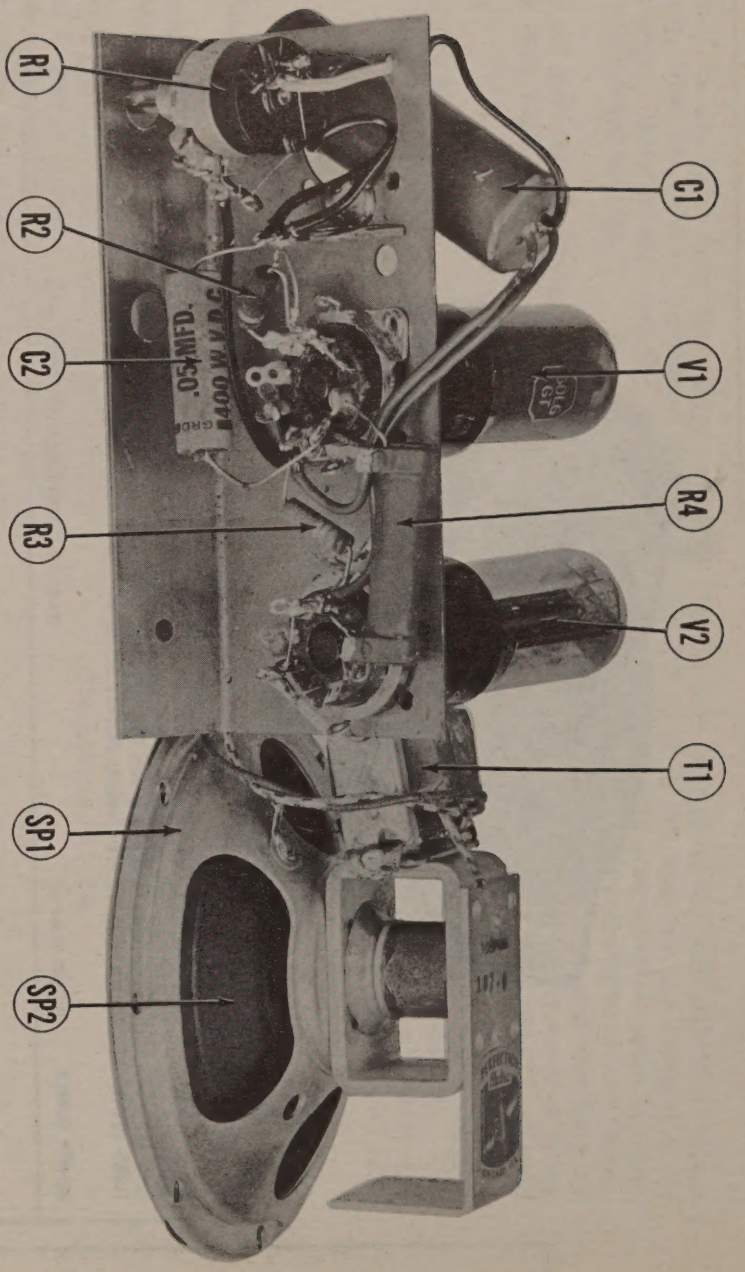
ITEM No.	RATINGS		REPLACEMENT DATA: AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-105 *	5A07 * ¶	* Remount output transformer.
SP1	PM	3.5Ω		MOD. P5-X §		§ Fabricate mounting brackets.
	CONE DIA.	V. C. DIA.				¶ Use universal mounting brackets provided.
SP2	4 3/4"	9/16"				

PHONO CARTRIDGE

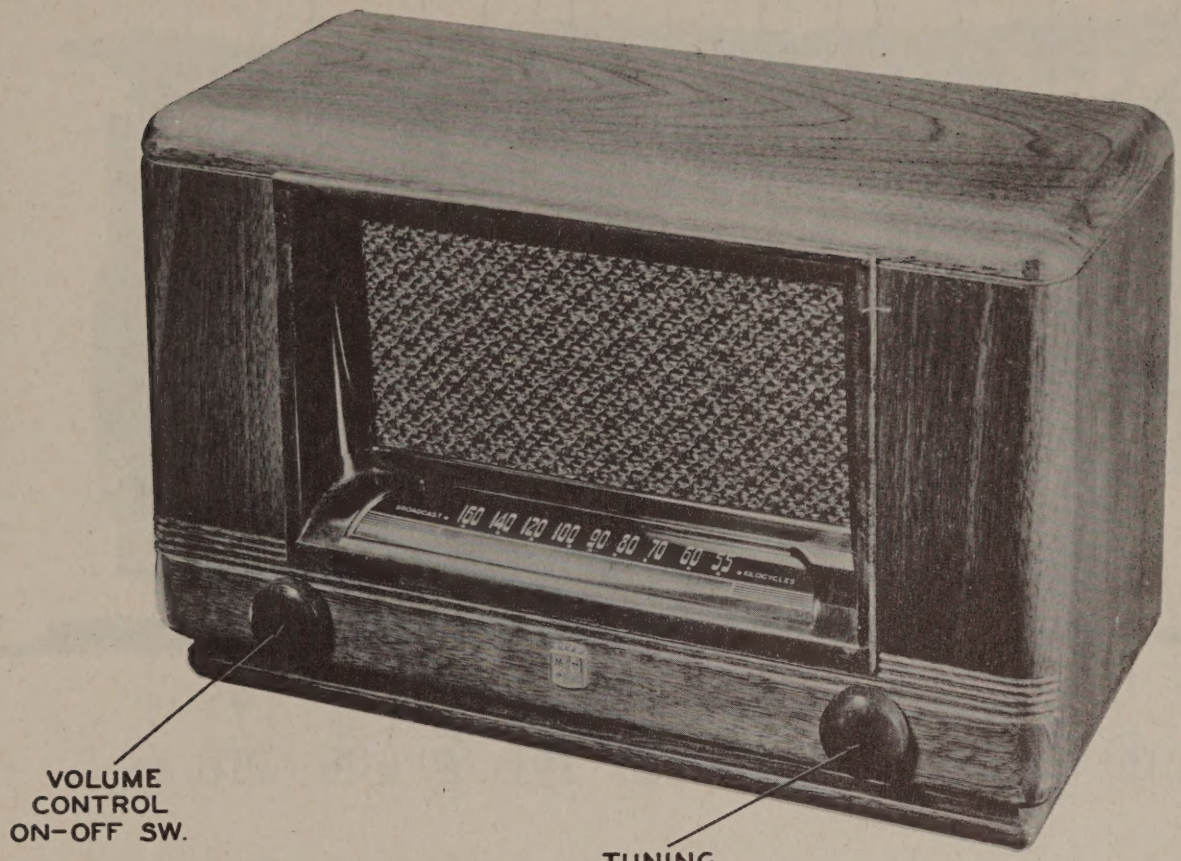
ITEM No.	REPLACEMENT DATA: AIRCASTLE PART No.	ASTATIC PART No.	REMARKS
M1	359	M-22 ‡	‡ Requires special mounting brackets.

MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
	Cabinet	TMB-1	
	Knob	VC-2	



AIRLINE
MODEL 94WG-1804D



AIRLINE
MODEL 94WG-1804D

AIRLINE MODEL 94WG-1804D

TRADE NAME	Airline, Model 94WG-1804D
SUPPLIER	Montgomery Ward and Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types 12SK7 RF Amp., 12SA7 Converter, 12SF7 IF-DET-AVC, 12SJ7 AF Amp., 35L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC-DC — RATING .24 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning gang fully closed and set the dial pointer to the calibration on the right end of dial backplate. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (Grid) of 12SA7 (V2). Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1620KC	"	"	A5	Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRLINE PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	12SK7	12SK7	8N	
V2	Converter	12SA7	12SA7	8R	
V3	IF-DET.-AVC	12SF7	12SF7	7AZ	
V4	AF Amp.	12SJ7	12SJ7	8N	
V5	Power Output	35L6GT	35L6GT	7AC	
V6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	45X344	PRSA1010D4A	EDL5515C		TA-309	Filter-Red
B	50	150						Filter-Green
C	20	25						Output Cath. Bypass-Yellow
C2	.001	600	D67102	P688-001	PTE6D1	GP2L-001	TM-21	Ext. Ant. Isolation
C3	100	500	47X476	1468-0001	5W5T1	GP1K-100	1FM-31	RF Coupling
C4	.05	200	B66503	P288-05	PTE4S5		TM-15	Decoupling
C5	.05	200	B66503	P288-05	PTE4S5		TM-15	AVC Filter
C6	100	500	47X476	1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C7	47	500	47X463	1468-00005	5W5Q5	GP1K-47	1FM-45	Tone Compensation
C8	.04	200	B67403	P288-04	PTE6S4		TM-14	Tone Compensation
C9	.006	600	B67602	P688-006	PTE6D6	811-005	TM-26	Audio Coupling
C10	.1	200	B66104	P288-1	PTE4P1		TM-1	AF Amp. Screen Bypass
C11	.025	200	B67253	P488-025	PTE4S2		TM-12	AF Amp. Plate Decoupling
C12	470	500	47X467	1468-0005	5W5T5	GP2K-470	1FM-35	AF Amp. Plate Bypass
C13	.01	400	B66103	P488-01	PTE4S1	821-01	TM-11	Audio Coupling
C14	.01	400	B66103	P488-01	PTE4S1	821-01	TM-11	Output Plate Bypass
C15	.2	200	B67204	P488-22	GT4P2		72P53	Line Isolation
C16	.1	400	D67104	P488-1	PTE4P1		TM-1	Line Filter

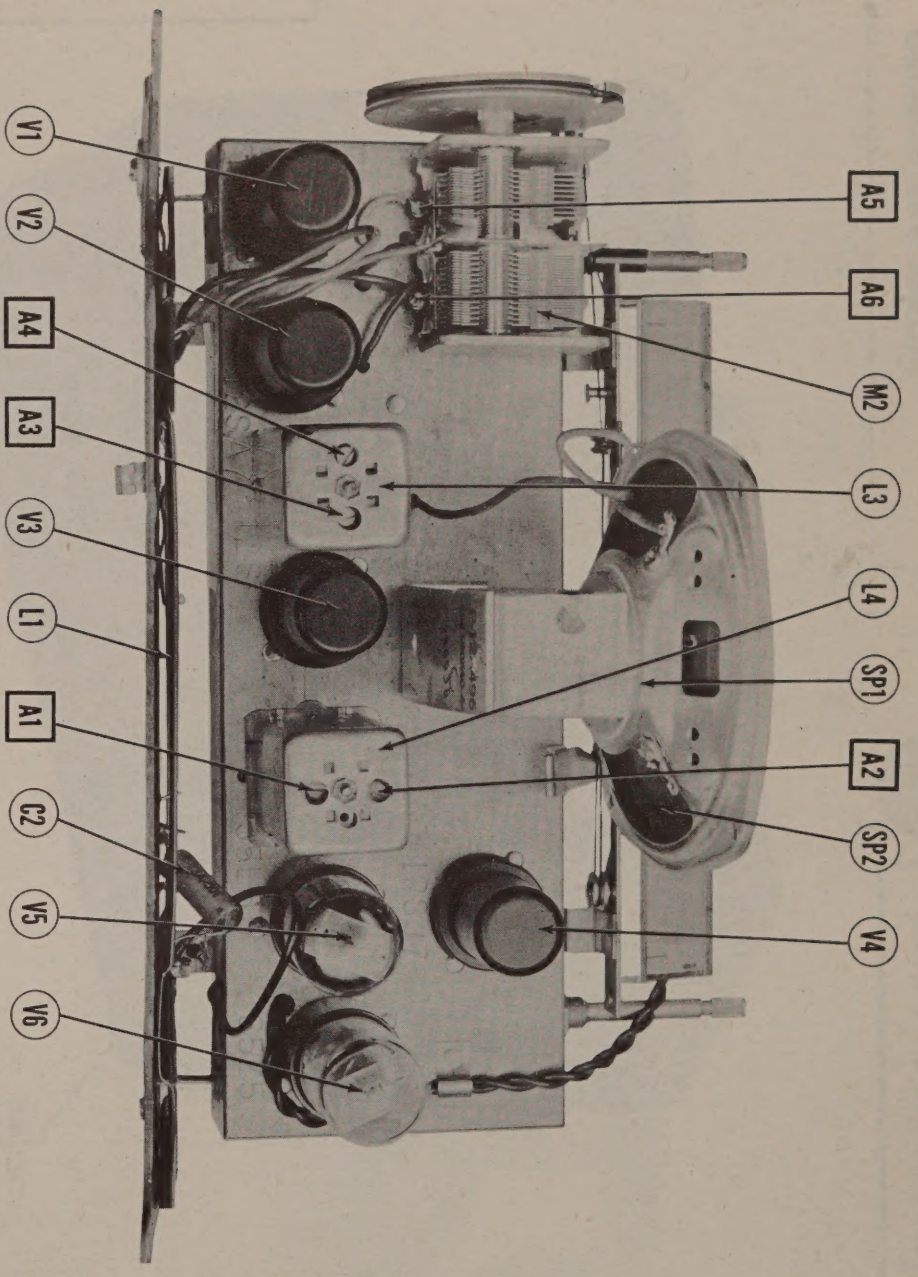
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	500KΩ	½	36X347	Q13-133X		Volume control, tapped at 100KΩ
B	Switch		Not Req.	76-1		Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	
R2	3300Ω	½	B84332	BTS-3300	RF Plate
R3	100KΩ	½	B85104	BTS-100K	Conv. Grid
R4	22KΩ	½	B85223	BTS-22K	Osc. Grid
R5	470Ω	½	B85471	BTS-470	Decoupling
R6	2.2 Meg.	½	B85225	BTS-2.2 Meg.	AVC Network
R7	15KΩ	½	B84153	BTS-15K	Tone Compensation
R8	47KΩ	½	B85473	BTS-47K	Diode Filter
R9	4.7 Meg.	½	B85475	BTS-4.7 Meg.	AF Grid
R10	470KΩ	½	B84474	BTS-470K	AF Screen
R11	33KΩ	½	B84333	BTS-33K	AF Plate
R12	82KΩ	½	B84823	BTS-82K	AF Plate Decoupling
R13	470KΩ	½	B84474	BTS-470K	Output Grid
R14	180Ω 5%	½	B83181	BW-½-180-5%	Output Cathode
R15	1500Ω	1	C84152	BW-1-1500	Filter
R16	27Ω	½	B84270		Rect. Ballast
R17	39Ω	2	D84390	BW-2-39	Filament Dropping
R18	270KΩ	½	B84274	BTS-270K	Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	3KΩ	3.1Ω	340Ω	.8Ω	51X116	A-3849	A-2928 #	RO-2 #	# Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-105 †		† Fabricate new mounting bracket.
SP1	PM	3.1Ω	12A496	MOD. P5-X	5A07 ‡	‡ Use universal mounting bracket provided.
	CONE DIA.	V. C. DIA.				
SP2	4 1/2"	9/16"				

R F COILS

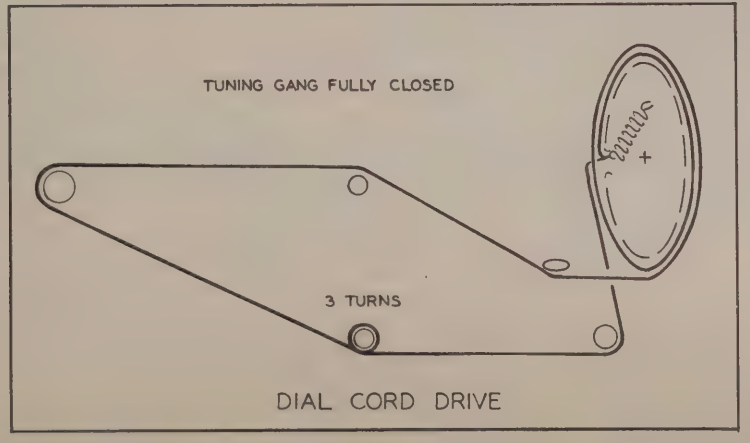
ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.
L1	Loop Ant.	1.5Ω		9A1944	
L2	Osc. Coil	.5Ω	6Ω	9A1911	14-1073
L3	Input IF	2Ω	20Ω	9A1775	16-6678
L4	Output IF	2Ω	18Ω	9A1776	16-6678

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRLINE PART No.		
M1	Bayonet	6-8	.15	Brown	7A103		Type #47

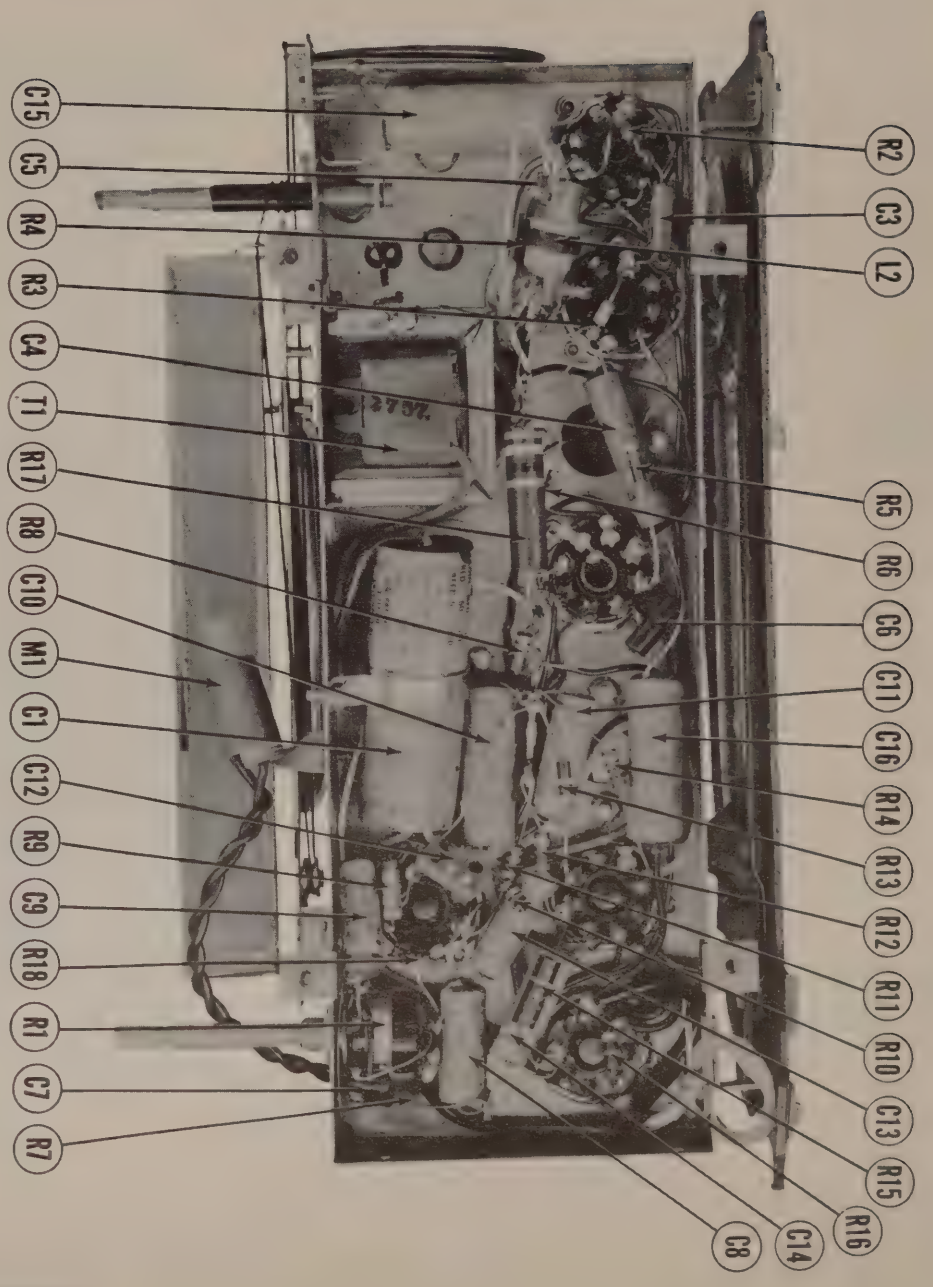
MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M2	2 Gang Var. Cap.	14A194	(35-470MMF, 42-205MMF)
	Dial	58X667	
	Dial Pointer	15X217	
	Diffuser	41X81	Dial Light
	Knob	10A297	On-Off, Volume, Tuning
	Knob	10A712	

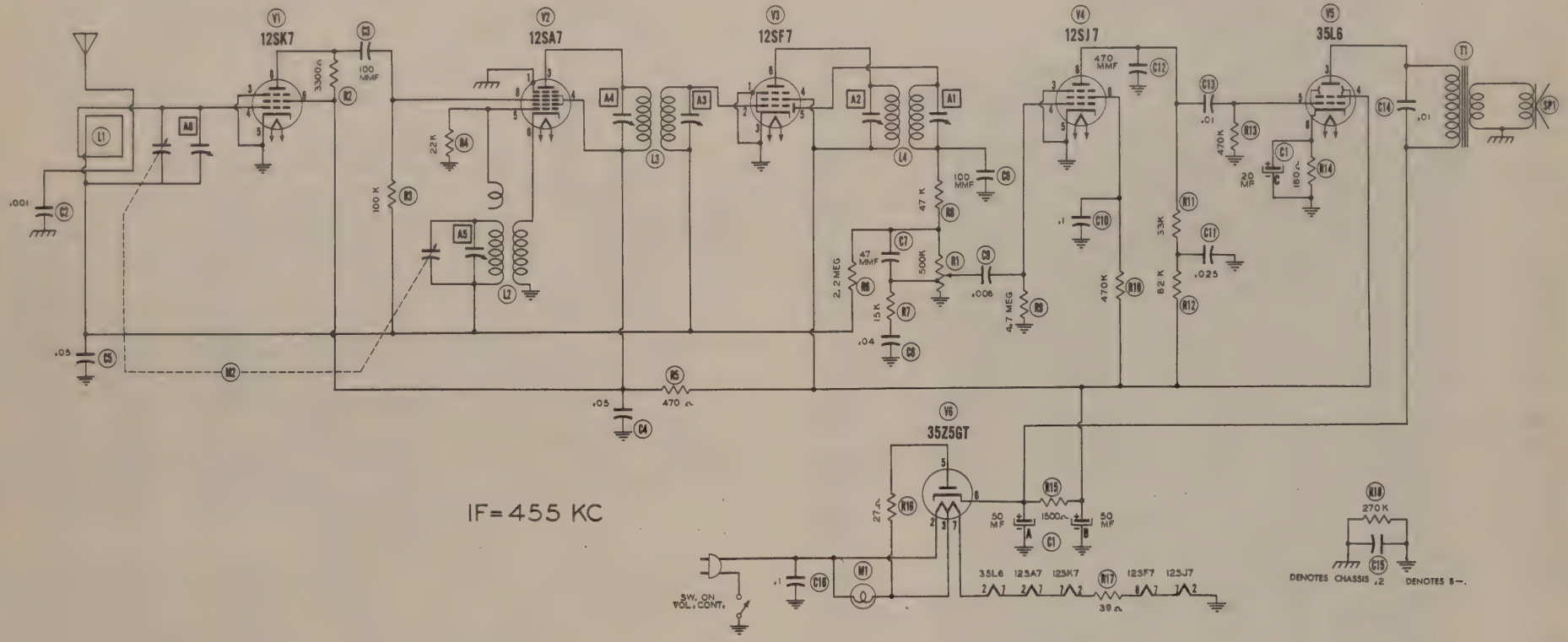


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



AIRLINE MODEL 94WG-1804D



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SK7	0V.	30VAC	0V.	-1.4VDC	0V.	70VDC	42VAC	40VDC
V 2	12SA7	0V.	53VAC	70VDC	70VDC	§-6.3VDC	0V.	42VAC	-.4VDC
V 3	12SF7	0V.	-.5VDC	0V.	75VDC	-.6VDC	75VDC	12VAC	24VAC
V 4	12SJ7	0V.	0V.	0V.	-.6VDC	0V.	15VDC	12VAC	20VDC
V 5	35L6GT	0V.	86VAC	110VDC	75VDC	0V.	0V.	53VAC	5VDC
V 6	35Z5GT	0V.	117VAC	113VAC	0V.	110VAC	0V.	86VAC	130VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SK7	270KΩ	68Ω	0Ω	2.7 Meg.	0Ω	†2KΩ	80Ω	†5.3KΩ
V 2	12SA7	270KΩ	92Ω	†2KΩ	†2KΩ	22KΩ	1Ω	80Ω	2.8 Meg.
V 3	12SF7	270KΩ	2.7 Meg.	0Ω	†1.5KΩ	500KΩ	†1.5KΩ	13Ω	28Ω
V 4	12SJ7	270KΩ	0Ω	0Ω	4.7 Meg.	0Ω	†470KΩ	13Ω	†115KΩ
V 5	35L6GT	Inf.	120Ω	†320Ω	†1.5KΩ	470KΩ	Inf.	93Ω	180Ω
V 6	35Z5GT	Inf.	150Ω	150Ω	Inf.	180Ω	Inf.	120Ω	40KΩ

† MEASURED FROM PIN 8 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

CORONADO MODEL
43-8965

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CORONADO
MODEL 43-8965

TRADE NAME	Coronado Model 43-8965
SUPPLIER	Gamble-Skogmo Inc., 15 North 8th St., Minneapolis, Minn.
TYPE SET	Television Receiver
TUBES	Eighteen

POWER SUPPLY 105-125 Volts AC or DC RATING: .97 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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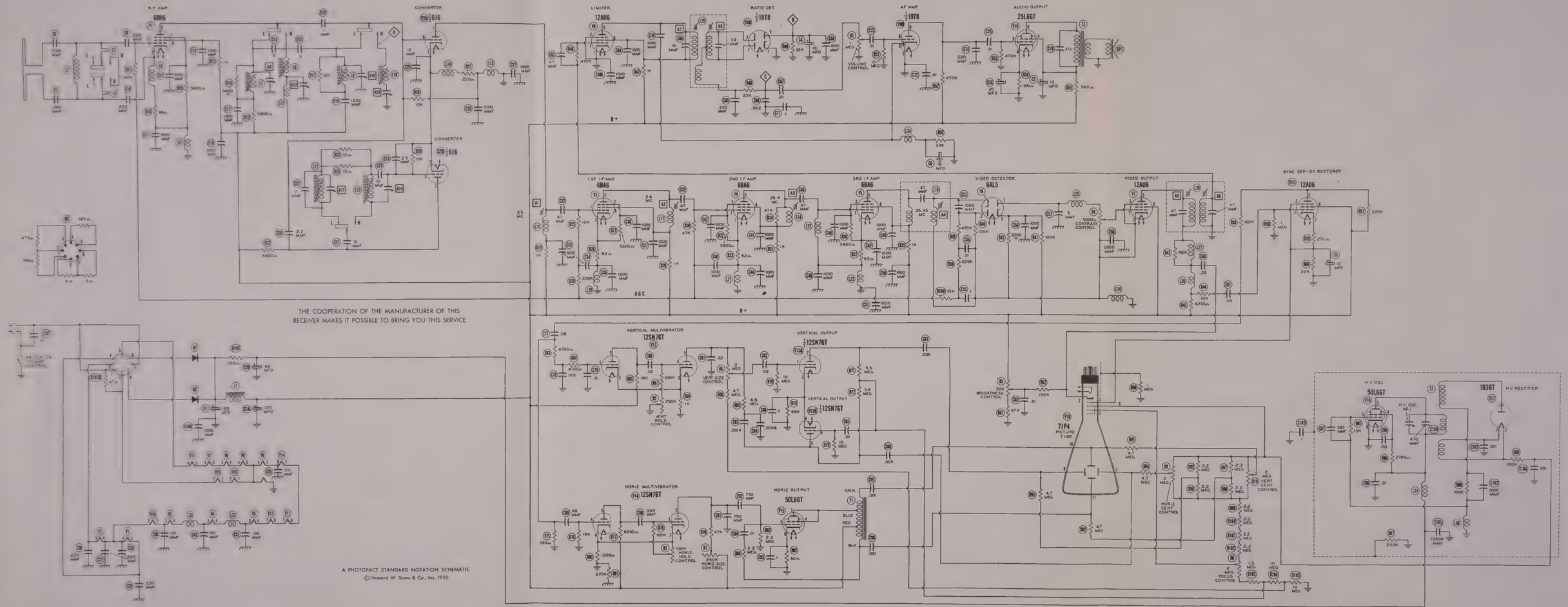

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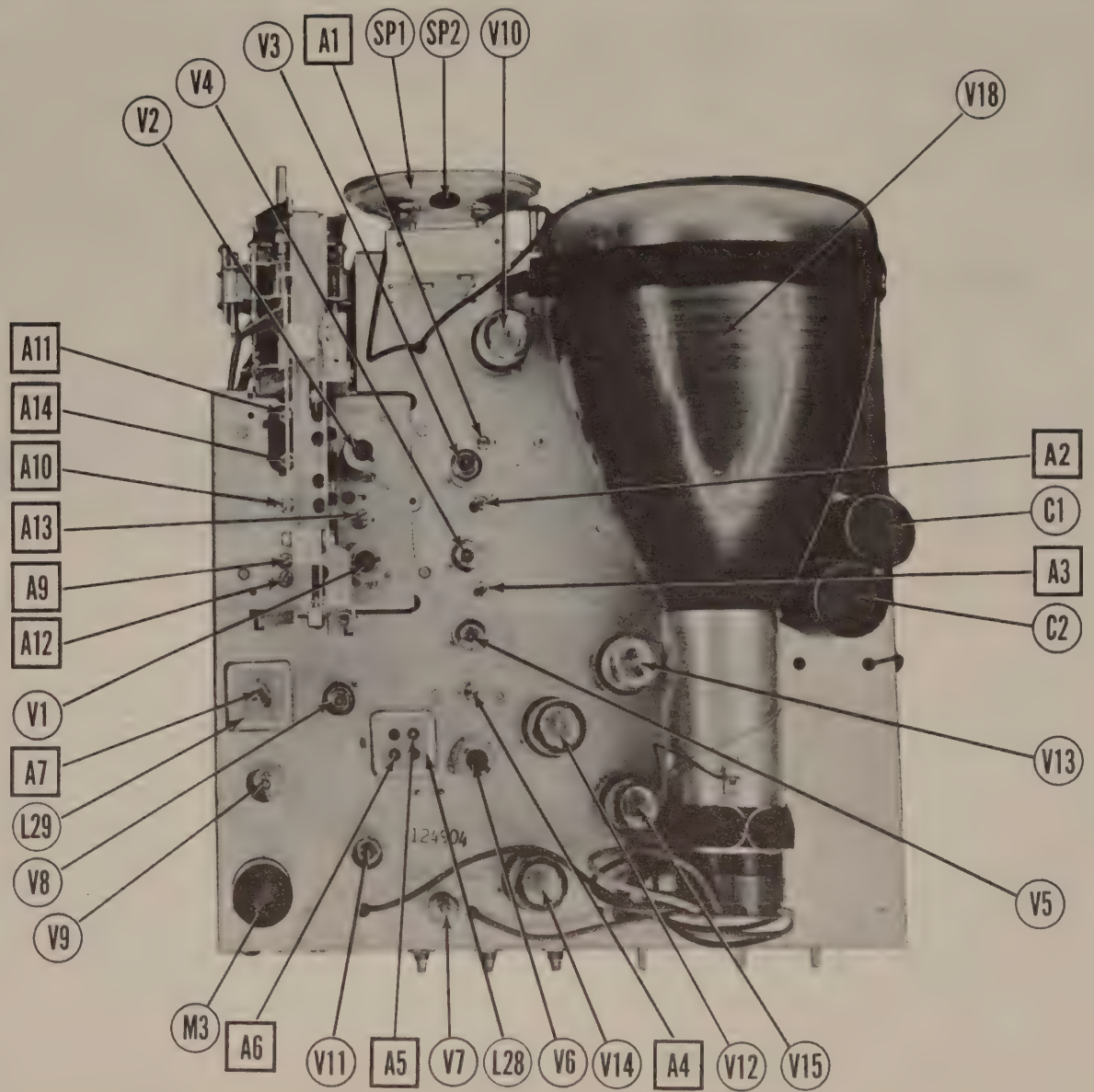
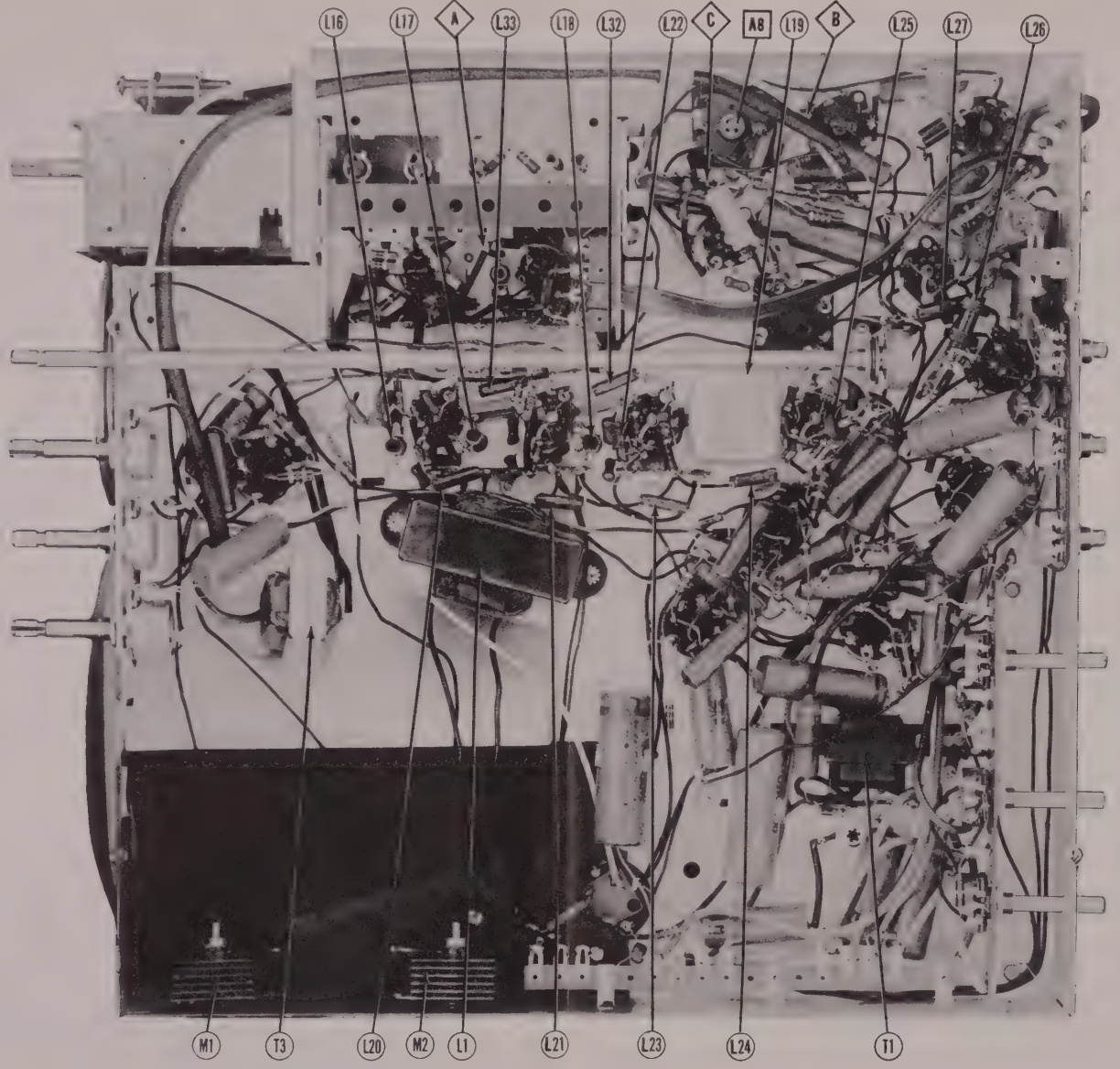
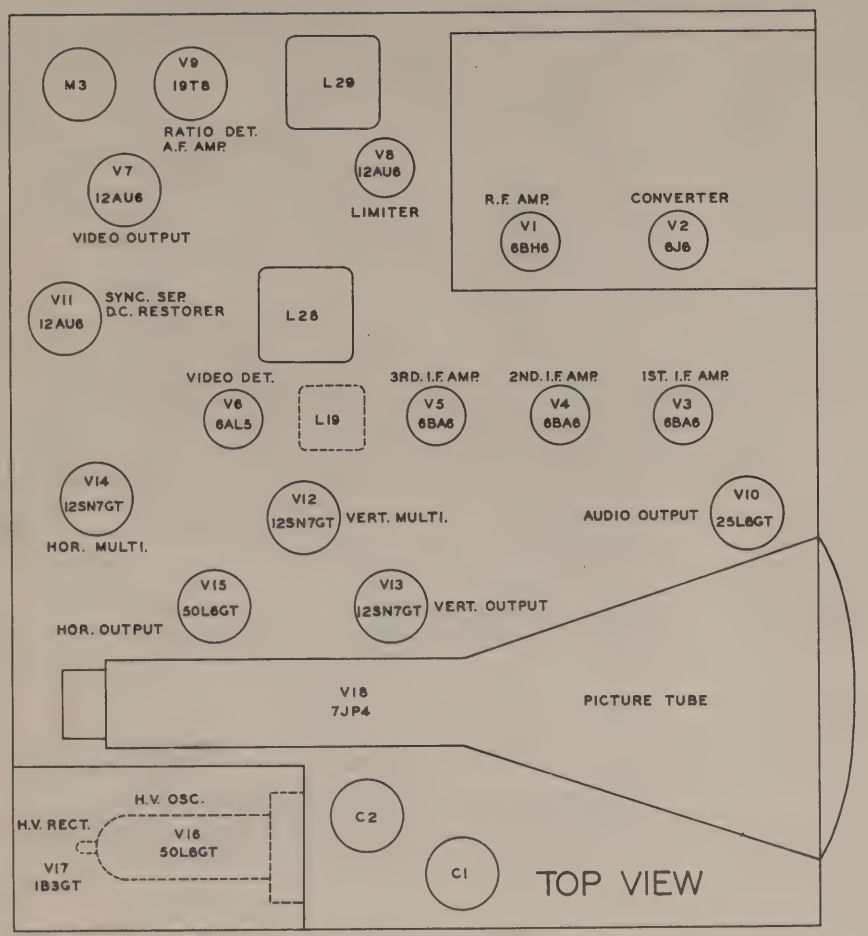
CORONADO
MODEL 43-8965

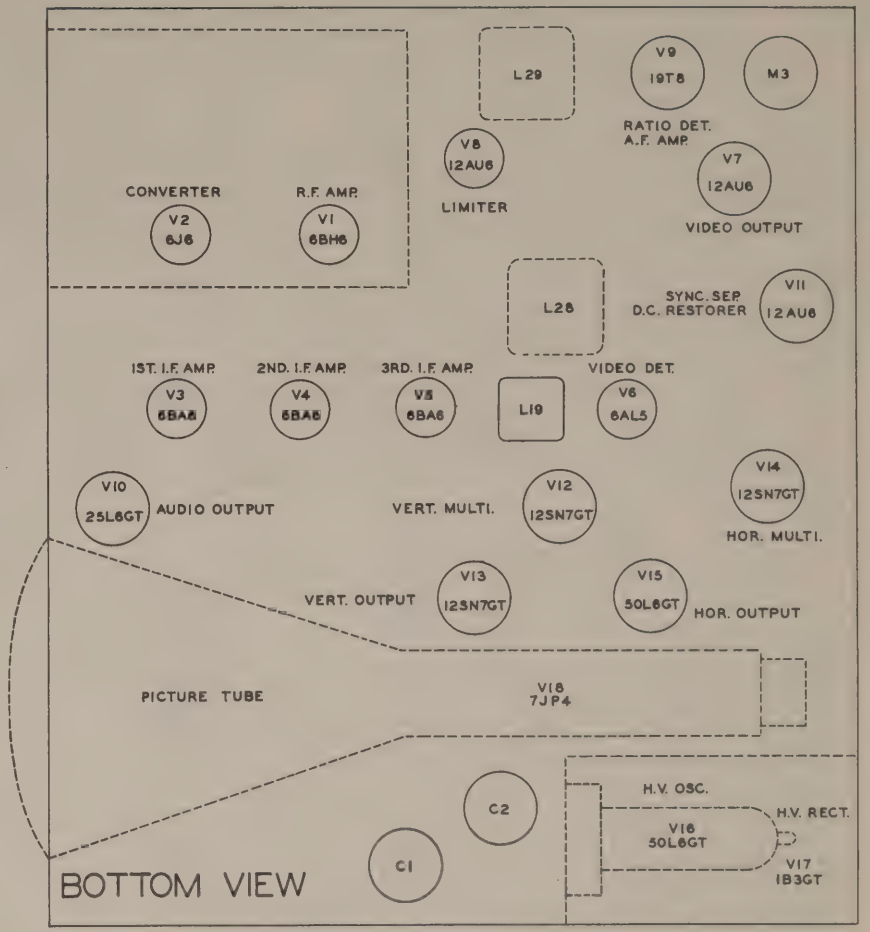


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

PRE- ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Alignment of this receiver may be performed without removal of the picture tube or disabling the high voltage supply. When the receiver is placed on its side, care must be exercised not to damage the picture tube or to come in contact with the high voltage leads.

VIDEO IF ALIGNMENT

Alignment point A, where the IF signal is injected is accessible thru the large hole in the tuner shield on the underside of the tuner.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	47MMF	High side thru 47MMF to Point A. Low side to chassis.	23.0MC	9	Across contrast control (R4)	A1	Adjust for maximum deflection.
2.	47MMF	"	24.0MC	"	"	A2	"
3.	47MMF	"	26.4MC	"	"	A3	"
4.	47MMF	"	25.45MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	47MMF	High side to Point A. Low side to chassis.	24MC (10MC Sweep)	26.75MC 22.25MC	9	Across contrast control (R4) with 10KΩ in series with Vert. Amp. lead. Shunt vertical input terminals with .001MFD capacitor.		If necessary, slightly retouch A1, A2, A3, A4 for proper response curve and placement of markers as per Fig 1.

SOUND IF ALIGNMENT

Short the antenna leads during alignment of the ratio detector circuit so extraneous noise pulses will not give erratic indications on the oscilloscope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	Across contrast control (Control fully on)	4.5MC (1MC Sweep)	4.5MC	9	Vert. Amp. to Point (B) Low side to B-.	A5,A6	Disconnect stabilizer cap (C4). Adjust for maximum amplitude and symmetry as per Fig 2.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to B-.	A7,A8	Reconnect stabilizer cap. Adjust A7 so 4.5MC marker is at center of pattern as per Fig 3. Adjust A8 for maximum amplitude and straightness of diagonal line.

TUNER ALIGNMENT

Pre-set the tuner cores and trimmers as indicated in figures 4 and 5 before attempting alignment of the tuner. If Fig.5, the dimensions given are the distance from the screw head shoulder to chassis.

When making the adjustments of the station selector screws do not force the screw at any time. The "in" position is reached when the black shuttle bar holding the core slugs reaches the top limit of its travel. It is possible to force the screw in farther than this point but this results in jamming the tuner.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 125Ω carbon res.	Across antenna terminals with 125Ω resistor in each generator lead.	Approx. 85MC (10MC Sweep)	Off	6	Across contrast control (R4) with 10KΩ in Vert. Amp. lead. Shunt vert. input terminals with .001MMF capacitor.	A9,A10	Turn channel 6 station selector screw 1 full turn from its maximum "in" position. Adjust A9 and A10 for maximum amplitude and symmetry as per Fig 6.
9.	"	"	"	83.25MC	"	"	A11	Adjust A11 so marker is 50% down on the low frequency slope on curve. If necessary, repeat step 8.
10.	"	"	Approx. 79MC (10MC Sweep) Approx. 69MC (10MC Sweep) Approx. 63MC (10MC Sweep)	77.25MC 67.25MC 61.25MC	5 4 3	"		Check the response on all low band channels. It may be necessary to forfeit some of the response on one channel to improve that of another by slight retouching of A9 and A10.
11.	"	"	Approx. 57MC (10MC Sweep)	55.25MC	2	"		If it is possible to move video marker to 50% point on the curve by the station-selector screw (with screw at least 2 turns from its maximum "out" position) the low band is properly aligned.

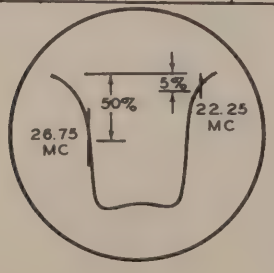


FIG. 1

FIG. 2

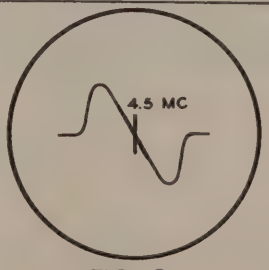
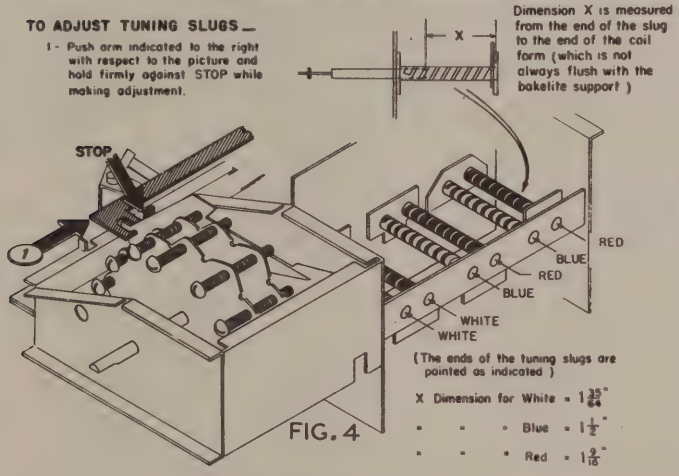


FIG. 3

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	"	"	Approx. 213MC (10MC Sweep)	Off	13	"	A12, A13	Turn channel 13 station selector screw 3/4 turn from it maximum "in" position. Adjust A12 and A13 for maximum amplitude and symmetry as per Fig 6.
13.	"	"	"	211.25MC	"	"	A14	Adjust A14 so marker is 50% down on the low frequency slope on curve. If necessary, repeat step 12.
14.	"	"	Approx. 207MC (10MC Sweep) Approx. 201MC (10MC Sweep) Approx. 195MC (10MC Sweep) Approx. 189MC (10MC Sweep) Approx. 183MC (10MC Sweep)	205.25MC 199.25MC 193.25MC 187.25MC 181.25MC	12 11 10 9 8	"		Check response on all high band channels. If necessary, retouch A12 and A13 for compromise to give best overall response curve.
15.	"	"	Approx. 177MC (10MC Sweep)	175.25MC	7	"		If it is possible to move video carrier marker to 50% point on response curve by adjustment of channel 7 station-selector screw (screw at least one full turn in from its maximum "out" position), the high band is properly aligned.


TO ADJUST TUNING SLUGS —
1 - Push arm indicated to the right with respect to the picture and hold firmly against STOP while making adjustment.
X
Dimension X is measured from the end of the slug to the end of the coil form (which is not always flush with the bakelite support)
STOP
1
RED
BLUE
RED
BLUE
WHITE
WHITE
(The ends of the tuning slugs are painted as indicated)
X Dimension for White = 1 35/64"
" " " Blue = 1 1/2"
" " " Red = 1 9/16"
FIG. 4

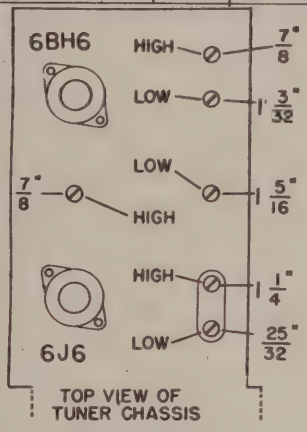


FIG. 5

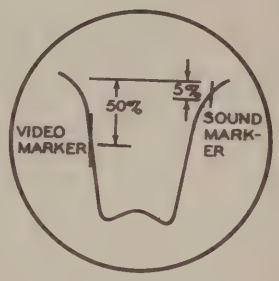
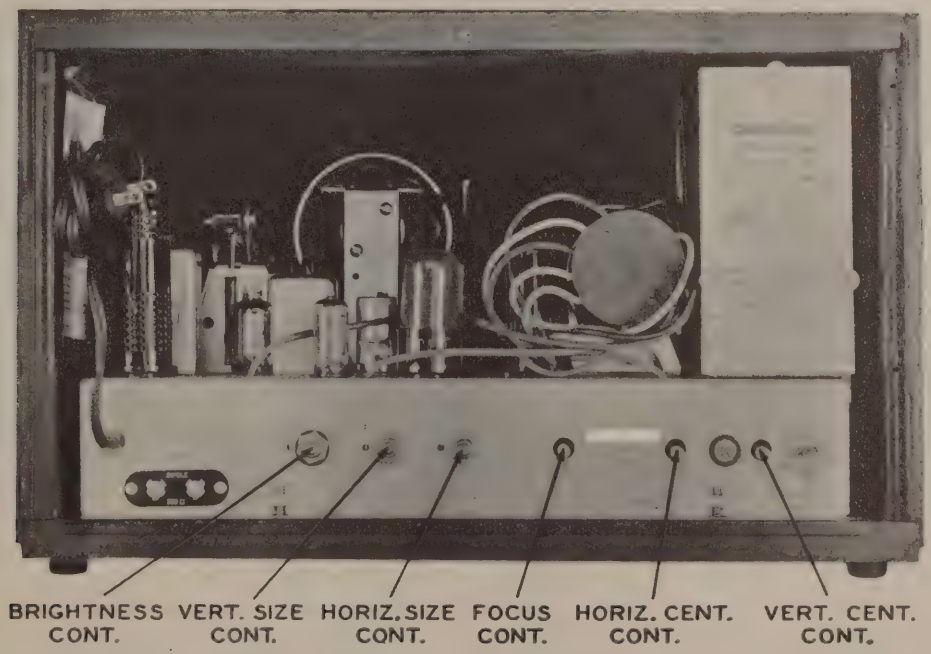


FIG. 6



CABINET-REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-.1VDC	.4VDC	85VAC	90VAC	100VDC	125VDC	0V		
V 2	6J6	125VDC	85VDC	95VAC	90VAC	§1.5 VDC	0V	2VDC		
V 3	6BA6	-.1VDC	1.1VDC	65VAC	58VAC	115VDC	115VDC	1.1VDC		
V 4	6BA6	-.1VDC	1.1VDC	58VAC	50VAC	115VDC	115VDC	1.1VDC		
V 5	6BA6	0V	1.7VDC	50VAC	45VAC	115VDC	115VDC	1.7VDC		
V 6	6AL5	0V	0V	12VAC	6VAC	4.2VDC	0V	-4VDC		
V 7	12AU6	0V	0V	35VAC	45VAC	40VDC	125VDC	0V		
V 8	12AU6	-.4VDC	0V	35VAC	24VAC	115VDC	115VDC	0V		
V 9	19T8	-.4VDC	-.6VDC	-.4VDC	24VAC	6VAC	-.6VDC	0V	-.4VDC	43VDC
V 10	25L6GT	0V	90VAC	93VDC	100VDC	0V	0V	65VAC	8VDC	
V 11	12AU6	0V	4.5VDC	45VAC	55VAC	87VDC	125VDC	4.5VDC		
V 12	12SN7GT	0V	80VDC	2.5VDC	2.5VDC	31VDC	2.5VDC	36VAC	24VAC	
V 13	12SN7GT	0V	295VDC	16VDC	0V	265VDC	16VDC	45VAC	36VAC	
V 14	12SN7GT	-1VDC	30VDC 65VDC	4.2VDC	0V	105VDC	4.2VDC	24VAC	12VAC	
V 15	50L6GT	0V	60VAC	125VDC	125VDC	-9.2VDC	0V	110VAC	1VDC	
V 16	50L6GT	0V	60VAC	130VDC	100VDC	-13.5 VDC	0V	6VAC	0V	
V 17	1B3GT	* DO NOT MEASURE								

	PINS	1	2	3	4	5	6	7	8	9	10	11	14
V18	7JP4	6VAC	120VDC	4.5VDC	0V	*	0V	*	*	*	*	*	0V

* Do Not Measure.

§TAKEN WITH VACUUM TUBE VOLTMETER

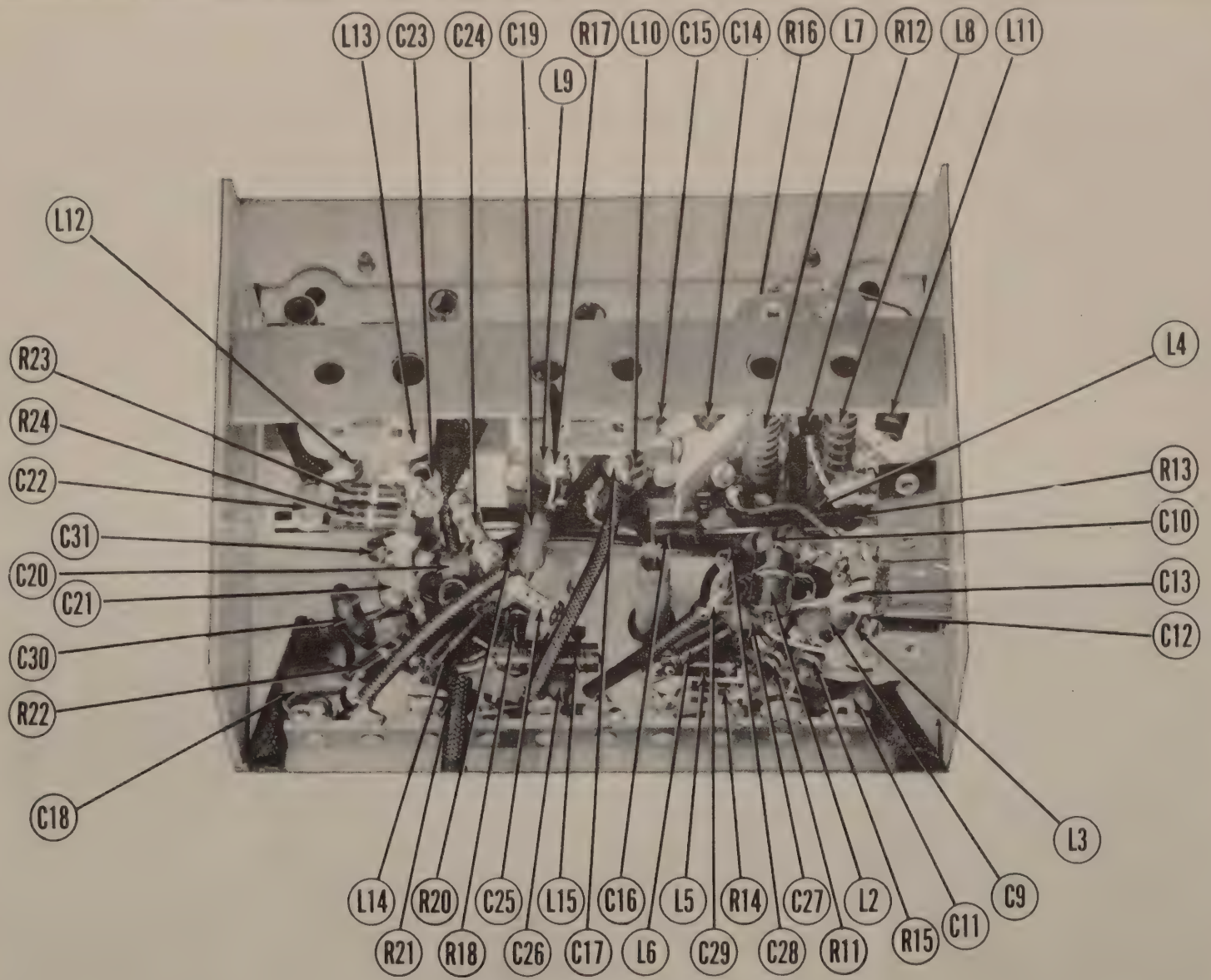
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	900KΩ	68Ω	42Ω	38Ω	†5.5KΩ	†1000Ω	5.6KΩ		
V 2	6J6	†1000Ω	†5.5KΩ	39Ω	38Ω	10KΩ	10KΩ	220Ω		
V 3	6BA6	1 Meg.	5.6KΩ	33Ω	31Ω	†1000Ω	†1000Ω	82Ω		
V 4	6BA6	850KΩ	5.6KΩ	30Ω	28Ω	†1000Ω	†1000Ω	82Ω		
V 5	6BA6	3Ω	5.6KΩ	27Ω	24Ω	†1000Ω	†1000Ω	82Ω		
V 6	6AL5	1.5Ω	100KΩ	4.5Ω	1.5Ω	3.3KΩ	Inf.	5KΩ		
V 7	12AU6	7Ω	1.5Ω	28Ω	36Ω	†8.2KΩ	†63Ω	1.5Ω		
V 8	12AU6	470KΩ	0Ω	28Ω	19Ω	†1000Ω	†1000Ω	0Ω		
V 9	19T8	Inf.	33KΩ	Inf.	19Ω	1.5Ω	33KΩ	0Ω	10 Meg.	†470KΩ
V 10	25L6GT	Inf.	37Ω	†800Ω	†620Ω	470KΩ	0Ω	33Ω	180Ω	
V 11	12AU6	1 Meg.	22KΩ	36Ω	44Ω	†220KΩ	†63Ω	22.2KΩ		
V 12	12SN7GT	10KΩ	†18KΩ	1000Ω	350KΩ	17 Meg.	1000Ω	20Ω	13Ω	
V 13	12SN7GT	10 Meg.	25.6 Meg.	68KΩ	10 Meg.	25 -6 Meg.	68KΩ	24Ω	20Ω	
V 14	12SN7GT	100KΩ	†300KΩ †50KΩ	1.2KΩ	18KΩ	†8.2KΩ	1.2KΩ	13Ω	4.5Ω	
V 15	50L6GT	Inf.	40Ω	†100Ω	†100Ω	2.2 Meg	0Ω	58Ω	62Ω	
V 16	50L6GT	Inf.	40Ω	†150Ω	†2.7KΩ	15KΩ	Inf.	1.5Ω	0Ω	
V 17	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP 100KΩ

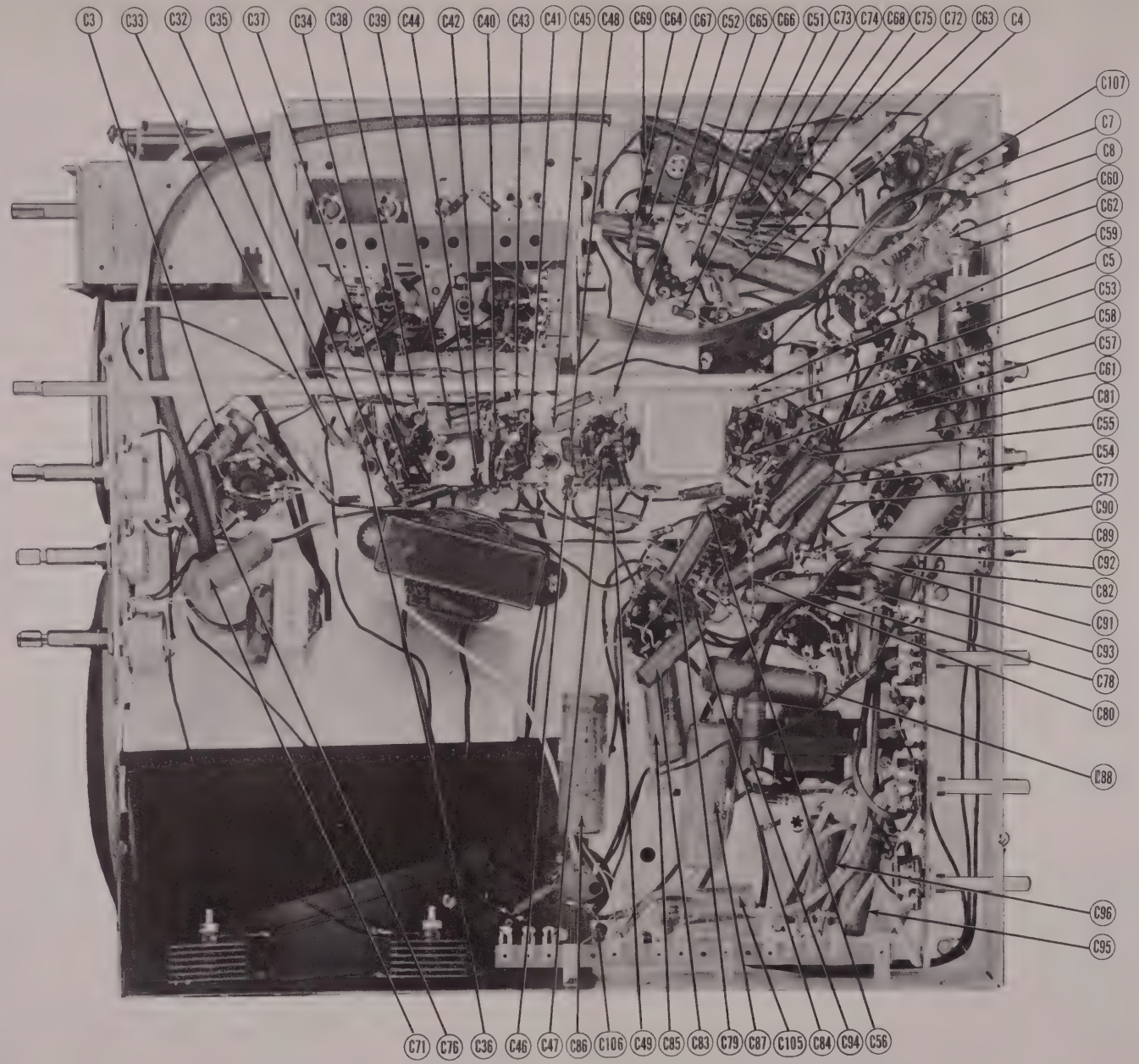
	PINS	1	2	3	4	5	6	7	8	9	10	11	14
V18	7JP4	1.5Ω	†180KΩ	22KΩ	Inf.	25 Meg.	Inf.	40 Meg.	40 Meg.	35 Meg	42 Meg 40 Meg	40 Meg	0Ω

† Measured From Output Of M1.

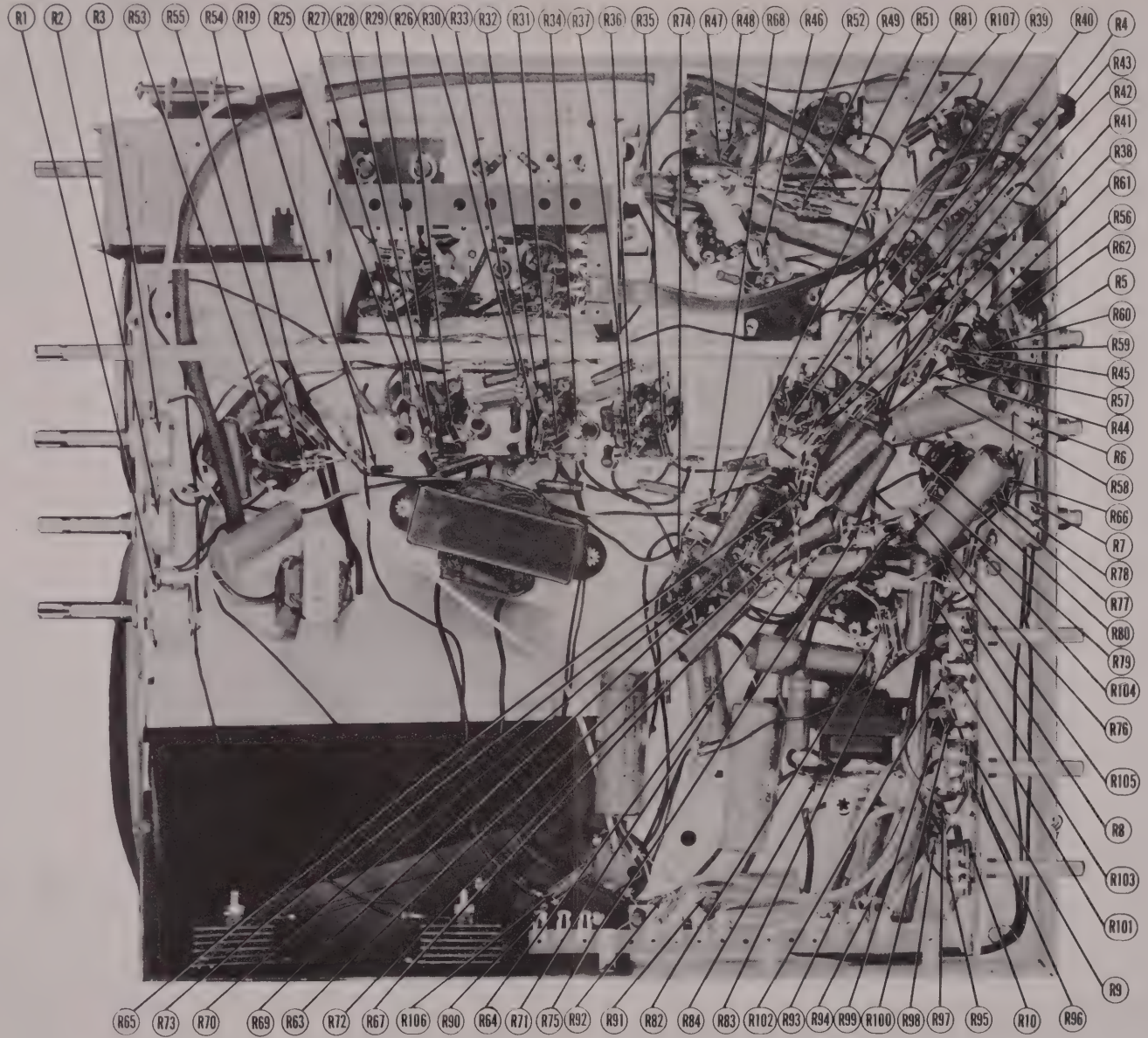
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



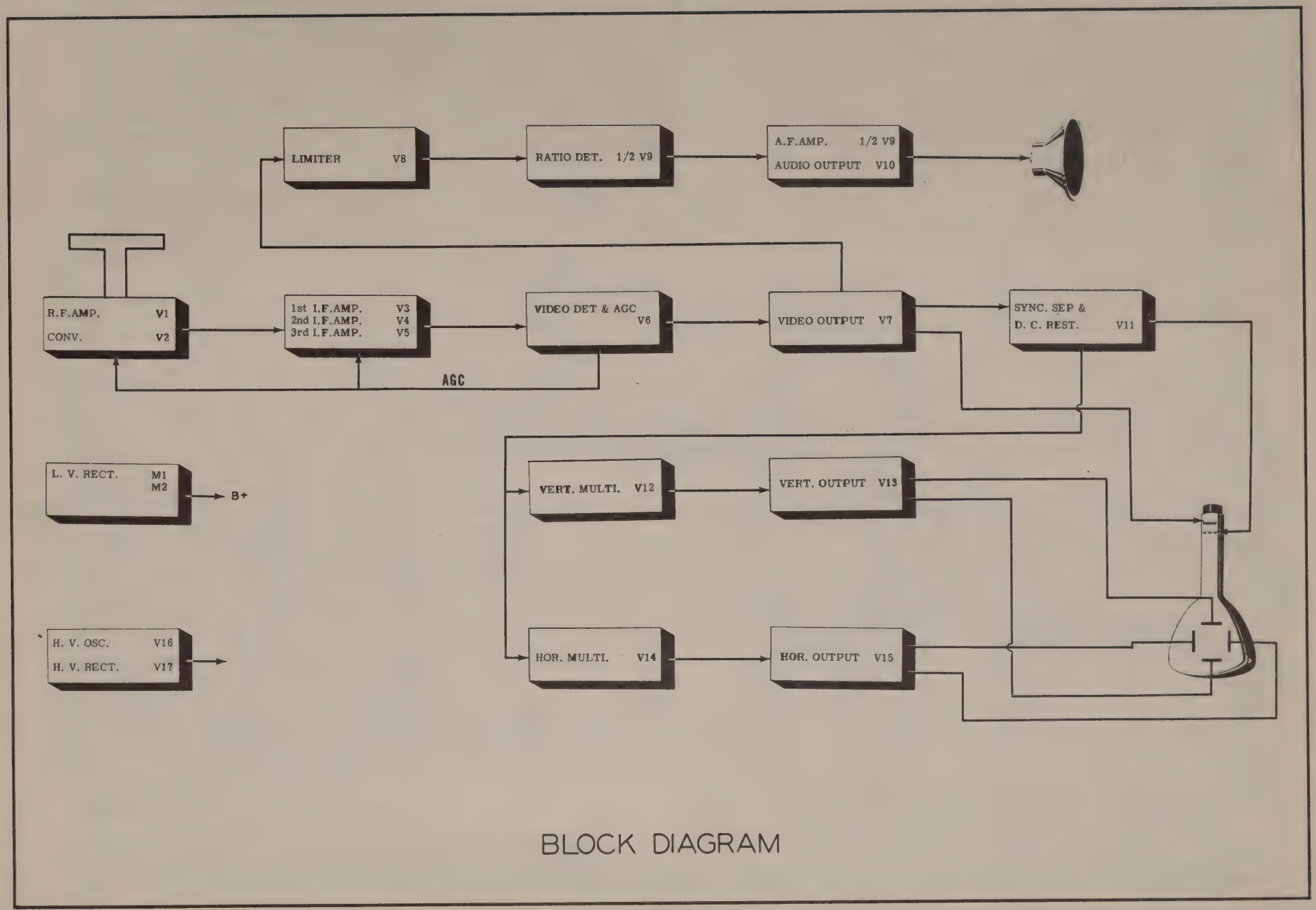
RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7BK	
V2	Converter	6J6	6J6	9A	
V3	1st Video IF	6BA6	6BA6	7BK	
V4	2nd Video IF	6BA6	6BA6	7BK	
V5	3rd Video IF	6BA6	6BA6	7BK	
V6	Detector	6AL5	6AL5	6AC	
V7	Video Output	12AU6	12AU6	7BK	
V8	Limiter	12AU6	12AU6	7BK	
V9	Ratio Det.-AF Amp.	19T8	19T8	9E	
V10	Audio Out.	25L6GT	25L6GT	7AC	
V11	Sync. Sep.-DC Rest.	12AU6	12AU6	7BK	
V12	Vert. Multi-vibrator	12SN7GT	12SN7GT	8BD	
V13	Vert. Output	12SN7GT	12SN7GT	8BD	
V14	Hor. Multi-vibrator	12SN7GT	12SN7GT	8BD	
V15	Hor. Output	50L6GT	50L6GT	7AC	
V16	HV Osc.	50L6GT	50L6GT	7AC	
V17	HV Rectifier	1B3GT	1B3GT	1J	
V18	Picture Tube	7JP4	7JP4	14J	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	120	150	B-8H-15664	AFH24D			TVL-44	Filter
C2A	120	150	B-8C-15948	AFH2412D4A	UP 555150†			▲ Filter
B	80	150						■ Filter
C	20	25					UT-121	Output Cathode Bypass
C3	10	150	A-8C-11495	PRS150/12	BR101S		UT-121	Output Decoupling
C4	15	15	A-8C-13132	PRS50/10	BR10S		TVA-14	Stabilizing Cap
C5	10	50	A-8C-13132	PRS50/10	BR10S		TVA-14	V. Amp. Cath. Bypass
C6	10	150	A-8C-11495	PRS150/12	BR101S		UT-121	Dyn. Limiter Cath. *
C7	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	Ant. Coupling
C8	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	Ant. Coupling
C9	220		C-8G-16045			GP2K-200		RF Coupling
C10	220		C-8G-16045			GP2K-200		RF Coupling
C11	1000		C-8G-13201			GP2L-001		RF Bypass
C12	1000		C-8G-13201			GP2L-001		RF Supp. Bypass
C13	1000		C-8G-13201			GP2L-001		RF Screen Bypass
C14	15		A-8G-12485 -7					RF Coupling
C15	15		A-8G-12485 -7					RF Coupling
C16	1		A-8G-12495 -2					RF Coupling
C17	1000		C-8G-13201			GP2L-001		RF Plate Dec.
C18	1000		C-8G-13201			GP2L-001		RF Bypass
C19	1000		C-8G-13201			GP2L-001		RF Bypass
C20	8.2		A-8G-12495 -4					Osc. Coupling
C21	51		C-8G-11891					Osc. Feedback
C22	7		C-8G-15224					Fixed Trimmer
C23	51		C-8G-11891					Osc. Grid Cap
C24	2.5		C-8G-15737					Osc. Feedback
C25	10		C-8G-11789			NP0K-10		Osc. Feedback
C26	1000		C-8G-13201			GP2L-001		RF Bypass
C27	1000		C-8G-13201			GP2L-001		RF Bypass
C28	220		C-8G-16045			GP2K-200		RF Fil. Bypass
C29	220		C-8G-16045			GP2K-200		RF Fil. Bypass
C30	220		C-8G-16045			GP2K-200		Conv. Fil. Bypass
C31	220		C-8G-16045			GP2K-200		Conv. Fil. Bypass
C32	47	450	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	IF Coupling
C33	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	Conv. Plate Dec.
C34	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	AGC Filter
C35	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	RF Bypass
C36	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	1st IF Supp. Bypass *
C37	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	1st IF Decoupling
C38	10		C-8G-11734	1468-0001	5W5T1	GP1K-100	1FM-31	1st IF Fil. Bypass
C39	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	IF Coupling
C40	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	AGC Filter
C41	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	2nd IF Decoupling
C42	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	2nd IF Supp. Bypass *
C43	10		C-8G-11734	1468-0001	5W5T1	GP1K-100	1FM-31	2nd IF Fil. Bypass
C44	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	RF Bypass
C45	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	IF Coupling
C46	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	RF Bypass
C47	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	3rd IF Cath. Bypass
C48	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	3rd IF Supp. Bypass *
C49	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	3rd IF Decoupling
C50	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	RF Bypass
C51	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	RF Bypass
C52	10		C-8G-11734	1468-0001	5W5T1	GP1K-100	1FM-31	3rd IF Fil. Bypass
C53	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	IF Coupling
C54	.01	200	C-8G-11738	P488-01		GT2S1	GP2-335-01	TM-11	AGC Filter
C55	.1	200	C-8D-10771	P288-1		GT2P1		TM-1	AGC Filter
C56	5000		A-8D-13962	1467-005	1D5D5	GP2M-005	1FM-25	RF Bypass
C57	5		C-8G-12166	1468-000005	5W5V5	NP0K-5	MS-55	V Diode Filter
C58	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	DAGC Decoupling
C59	100		C-8G-11734	1468-0001	5W5T1	GP1K-100	1FM-31	V DET-AGC Fil. Bypass
C60	.25	200	C-8D-10775	P488-25		GT2P25	TC-2	Video Coupling
C61	.05	200	C-8D-10770	P288-05		GT2S5	TM-15	Video Coupling
C62	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Pic Tube Cath. Dec.
C63	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	S. IF Coupling
C64	1500		C-8G-11751	1467-0015	1W5D15	GP2L-0015	1FM-215	S. IF Decoupling
C65	330	500	C-8F3-119	1468-0003	5W5T3	GP2K-300	1FM-335	Diode Load Cap
C66	.002	600	C-8D-10778	P688-002		GT6D2	GP2M-002	TM-22	De-emphasis
C67	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Audio Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C68	1500		C-8G-11731	1467-0015	1W5D15	GP2L-0015	1FM-215	RF Bypass
C69	10			1469-00001	5R5Q1	NP0K-10	MS-41	Fixed Trimmer *
C70	1000		C-8G-13201	1468-001	1W5D1	GP2L-001	1FM-21	S. IF Coupling *
C71	.1	400	C-8D-10760	P488-1		GT4P1	TM-1	Line Isolation
C72	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Line Isolation
C73	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Audio Coupling
C74	220		C-8G-11733	1468-00025	5W5T25	GP2K-250	1FM-325	AF Plate Bypass
C75	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Audio Coupling
C76	.03	200	C-8D-10992	P488-03		GT4S3		TM-13	Output Plate Bypass
C77	.05	200	C-8D-10770	P288-05		GT2S5		TM-15	Sync. Coupling
C78	.005	600	C-8D-10935	P688-005		GT6D5	GP2M-005	TM-25	Integrator Net
C79	.01	200	C-8D-11738	P488-01		GT6S1	GP2-335-01	TM-11	Integrator Net
C80	.02	200	C-8D-11304	P488-02		GT2S2		TM-12	Vert. Mult. Feedback
C81	.02	1600		P1688-02		GT16S2		MB-12	Vert. Discharge
C82	.02	1600		P1688-02		GT16S2		MB-12	Vert. Coupling
C83	.0014	1600		P1688-0015					Voltage Divider
C84	.0008	1600							Voltage Divider *
C85	.01	1600	B-8D-13693	P1688-01		GT16S1		MB-11	Vert. Coupling
C86	.005	6000	B-8D-13549	7584-005		DSTH -60D5		TVM-256	Vert. Coupling
C87	.005	6000	B-8D-13549	7584-005		DSTH -60D5		TVM-256	Vert. Coupling
C88	.1	600	C-8D-10983	P688-1		GT6P1		TM-1	Vert. Output Cath. Byp.
C89	68	500	C-8F3-111						Hor. Sync. Coupling
C90	330	500	C-8F3-119						Hor. Mult. Feedback
C91	750	500	C-8F3-246	1469-00075					Hor. Discharge
C92	750	500	C-8F3-246	1469-00075					Hor. Coupling
C93	.1	200	C-8D-10771	P288-1		GT2P1		TM-1	Hor. Output Cath. Byp.
C94	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Hor. Feedback
C95	.001	6000	B-8D-13523	7584-001		DSTH -60D1		TVM-216	Hor. Coupling
C96	.001	6000	B-8D-13523	7584-001		DSTH -60D1		TVM-216	Hor. Coupling
C97	330	500	C-8F3-119						HV Osc. Grid Cap
C98	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	HV Osc. Decoupling
C99	.02	200	C-8D-11304	P488-02		GT2S2		TM-12	HV Screen Byp.
C100	470	500	C-8F3-121	1469-0005		5R5T5		MS-35	Fixed Trimmer
C101	10000		A-8G-16019	P488-01		GT4S1	GP2-335-01	TM-11	RF Bypass
C102	1000		C-8G-13201	1468-001		1W5D1	GP2L-001	1FM-21	RF Bypass
C103	.001	6000	B-8D-13523					TVM-216	HV Filter
C104	.001	6000	B-8D-13523					TVM-216	HV Filter
C105	.1	400	C-8D-10760	P488-1		GT4P1		TM-1	HV Power Supply Isol.
C106	1000		C-8G-13201	1468-001		1W5D1	GP2L-001	1FM-21	RF Bypass
C107	.01	200	C-8D-11738	P488-01		GT2S1	GP2-335-01	TM-11	Line Filter
C108	1000			1468-001		1W5D1	GP2L-001	1FM-21	RF Bypass *

* Not Used In All Models.
† Parallel Sections To Obtain Desired Capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	A-10A15666	Q13-137	AM-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A Per Instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A Per Instructions
R2A	250KΩ	½	B-10B15671	Q11-130	AM-55-S	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R2A Per Instructions
R3A	100KΩ	½	B-10B15670	Q11-128	AM-49-S	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R3A Per Instructions
R4A	50000Ω	½	A-10B15272	Q11-114	AM-19-S	Contrast Control
B	Shaft		Not Req.	GQ	DFS-½	Attach to R4A Per Instructions
R5	50KΩ	½	A-10B15672	Q11-123	M-44-S	Brightness Control
R6	2 Meg.	½	A-10B16250	Q11-139	M-53-S	Vert. Size Control
R7	250KΩ	½	A-10B15614	Q11-130	M-55-S	Horiz. Size Control
R8	2 Meg.	½	B-10B15627			Focus Control
R9	2 Meg.	½	B-10B15627			Horiz. Centering Control
R10	2 Meg.	½	B-10B15627			Vert. Centering Control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R11	100KΩ	½	C-9B1-86		RF Grid
R12	56000Ω	½	C-9BL-71		RF Plate
R13	10000Ω	½	C-9B1-13		RF Screen Decoupling 20%
R14	68Ω	½	C-9B1-48		RF Cathode
R15	56000Ω	½	C-9B1-71		RF Suppressor Grid
R16	56000Ω	½	C-9B1-71		RF Coil Shunt
R17	10KΩ	½	C-9B1-74		Mixer Grid Coil Shunt
R18	10KΩ	½	C-9B1-74		Mixer Grid
R19	10000Ω	½	C-9B1-13		Mixer Plate Decoup. 20%
R20	10KΩ	½	C-9B1-74		Osc. Grid
R21	220Ω	½	C-9B1-54		Osc. Cathode
R22	56000Ω	½	C-9B1-71		Osc. Plate
R23	10Ω	½	C-9BL-38		Parasitic Supp.
R24	10Ω	½	C-9BL-38		Parasitic Supp.
R25	10KΩ	½	C-9B1-19		1st IF Grid 20%
R26	10000Ω	½	C-9B1-13		1st IF Decoup.
R27	56000Ω	½	C-9B1-71		1st IF Suppressor Grid See note 1
R28	82Ω	½	C-9B1-133		1st IF Cathode 5%
R29	220KΩ	½	C-9B1-27	BTS-220K	AGC Network 20%
R30	47KΩ	½	C-9B1-82		2nd IF Grid
R31	10000Ω	½	C-9B1-13		2nd IF Decoup. 20%
R32	56000Ω	½	C-9B1-71	BTS-5600	2nd IF Suppressor Grid See note 1
R33	82Ω	½	C-9B1-133		2nd IF Cathode 5%
R34	47KΩ	½	C-9B1-82		2nd IF Transformer Shunt
R35	10000Ω	½	C-9B1-13		3rd IF Decoup. 20%
R36	56000Ω	½	C-9B1-71		3rd IF Suppressor Grid See note 1
R37	68Ω	½	C-9B1-131		3rd IF Cathode 5%
R38	220KΩ	½	C-9B1-27	BTS-220K	AGC Network
R39	470KΩ	½	C-9B1-94	BTS-470K	AGC Network
R40	100KΩ	½	C-9B1-86	BTS-100K	AGC Diode Load

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R41	100KΩ	½	C-9B1-86	BTS-100K	Voltage Divider
R42	3300Ω	½	C-9B1-68	BTS-3300	Voltage Divider
R43	150KΩ	½	C-9B1-26	BTS-150K	Peaking Coil Shunt 20%
R44	10KΩ	½	C-9B1-19	BTS-10K	Phase Correction 20%
R45	8200Ω	½	C-9B1-73	BTS-8200	Video Output Plate
R46	470KΩ	½	C-9B1-94		Limiter Grid
R47	1000Ω	½	C-9B1-13		Limiter Decoup.
R48	22KΩ	½	C-9B1-78	BTS-22K	De-emphasis
R49	33KΩ	½	C-9B1-80	BTS-33K	Disc. Diode Load
R50	33KΩ	½	C-9B1-80	BTS-33K	Limiter Diode Load See Note 1
R51	10 Meg.	½	C-9B1-37	BTS-10 Meg.	AF Grid
R52	470KΩ	½	C-9B1-94	BTS-470K	AF Plate
R53	470KΩ	½	C-9B1-94	BTS-470K	Output Grid
R54	180Ω	1	C-9B2-53	BW-1-180	Output Cathode
R55	560Ω	1	C-9B2-59	BW-1-560	Filter
R56	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Sync. Sep. Grid 20%
R57	220KΩ	½	C-9B1-27	BTS-220K	Sync. Sep. Plate 20%
R58	180KΩ	½	C-9B1-89	BTS-180K	Sync. Coupling Network
R59	270Ω	½	C-9B1-55	BW-½-270	Sync. Sep. Cathode
R60	22KΩ	½	C-9B1-78	BTS-22K	Sync. Sep. Cathode
R61	47KΩ	½	C-9B1-82	BTS-47K	Voltage Divider
R62	150KΩ	½	C-9B1-26	BTS-150K	Voltage Divider
R63	4700Ω	½	C-9B1-70	BTS-4700	Integrator
R64	4700Ω	½	C-9B1-70	BTS-4700	Integrator
R65	18KΩ	1	C-9B2-77	BTA-18K	Vert. MV Plate
R66	4.7 Meg.	½	C-9B1-35	BTS-4.7 Meg.	Vert. MV Plate
R67	330KΩ	½	C-9B1-92	BTS-330K	Vert. MV Grid
R68	1000Ω	½	C-9B1-159	BTS-1000-5%	Vert. MV Cathode 5%
R69	6.8 Meg.	½		BTS-6.8 Meg.	Feedback
R70	10 Meg.	½	C-9B1-37	BTS-10 Meg.	Vert. Output Grid 20%
R71	5.6 Meg.	½	C-9B1-249	BTS-5.6Meg-5%	Vert. Output Plate 5%
R72	5.6 Meg.	½	C-9B1-249	BTS-5.6Meg-5%	Vert. Output Plate 5%
R73	10 Meg.	½	C-9B1-37	BTS-10 Meg.	Vert. Output Grid
R74	68KΩ	½	C-9B1-84	BTS-68K	Vert. Output Cathode
R75	560Ω	½	C-9B1-59	BTS-560	Differentiator
R76	18KΩ	½	C-9B1-77	BTS-18K	Horiz. MV Grid
R77	8200Ω	½	C-9B1-73	BTS-8200	Horiz. MV Plate
R78	47KΩ	½	C-9B1-82	BTS-47K	Horiz. MV Plate
R79	100KΩ	½	C-9B1-86	BTS-100K	Horiz. MV Grid
R80	120KΩ	½	C-9B1-161	BTS-1200-5%	Horiz. MV Cathode 5%
R81	220KΩ	½	C-9B1-27	BTS-220K	Isolation
R82	2.2 Meg.	½	C-9B1-102	BTS-2.2 Meg	Horiz. Output Grid
R83	62Ω	1	C-9B2-130	BW-½-62	Horiz. Output Cathode
R84	2.2 Meg.	½	C-9B1-102	BTS-2.2 Meg	Feedback
R85	15KΩ	½	C-9B1-76	BTS-15K	H V Osc. Grid
R86	2700Ω	1	C-9B2-66	BTA-2700	H V Osc. Screen
R87	220KΩ	½	C-9B1-27	BTS-220K	Isolation
R88	100KΩ	1	C-9B2-25		H V Filter
R89	100KΩ	½	C-9B1-25		H V Filament
R90	1 Meg.	½	C-9B1-31	BTS-1 Meg.	Isolation See note 1
R91	4.7 Meg.	½	C-9B1-55		Vert. Deflection Load
R92	4.7 Meg.	½	C-9B1-35		Vert. Deflection Load
R93	4.7 Meg.	½	C-9B1-35		Horiz. Deflection Load
R94	4.7 Meg.	½	C-9B1-35		Horiz. Deflection Load
R95	2.2 Meg.	½	C-9B1-102		Voltage Divider
R96	2.2 Meg.	½	C-9B1-102		Voltage Divider
R97	2.2 Meg.	½	C-9B1-102		Voltage Divider
R98	2.2 Meg.	½	C-9B1-102		Voltage Divider
R99	2.2 Meg.	1	C-9B2-239		Voltage Divider 5%
R100	2.2 Meg.	1	C-9B2-239		Voltage Divider 5%
R101	2.2 Meg.	1	C-9B2-239		Voltage Divider 5%
R102	2.2 Meg.	1	C-9B2-239		Voltage Divider See note 1 5%
R103	1.5 Meg.	1	C-9B2-235		Voltage Divider 5%
R104	10 Meg.	½	C-9B1-37		Voltage Divider 20%
R105	10 Meg.	½	C-9B1-37		Voltage Divider See note 1 20%
R106	150Ω	1	C-9B2-8	BW-2-150	Filter
R107A	47Ω	2	C-9B4-5	BW-2-47	Filament String
B	62Ω	1	C-9B2-130	BW-1-62	Filament String See note 1.
R108	10KΩ	½		BTS-10K	Bias Network See note 1.

Note 1 - Not used in all models.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: MERIT PART No.	NOTES
T1	270Ω Tap @ 160Ω & 110Ω		B-12M-15662				Hor. Deflection Transformer.

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: MERIT PART No.	NOTES
T2	3Ω	SEC. 1 510Ω SEC. 2 0Ω	B-20-15557				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
T3	2100Ω	3.5Ω	192Ω	.7Ω	B-12C-10074-4	A-3876	RO-2	A-2928	

CORONADO MODEL 43-8965

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	CORONADO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.5Ω	B-18A-15618	ST-113† MOD.P4-X	4A07†	† Trim flange and mounting bracket.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	CORONADO PART No.	STANCOR PART No.	CHICAGO PART No.	MERIT PART No.	
L1	.185A	63Ω	2.6Henries	C-16A15624	C-2325	TR-4225	C-2991‡	‡ Drill one new mounting hole.

COILS (RF-IF)

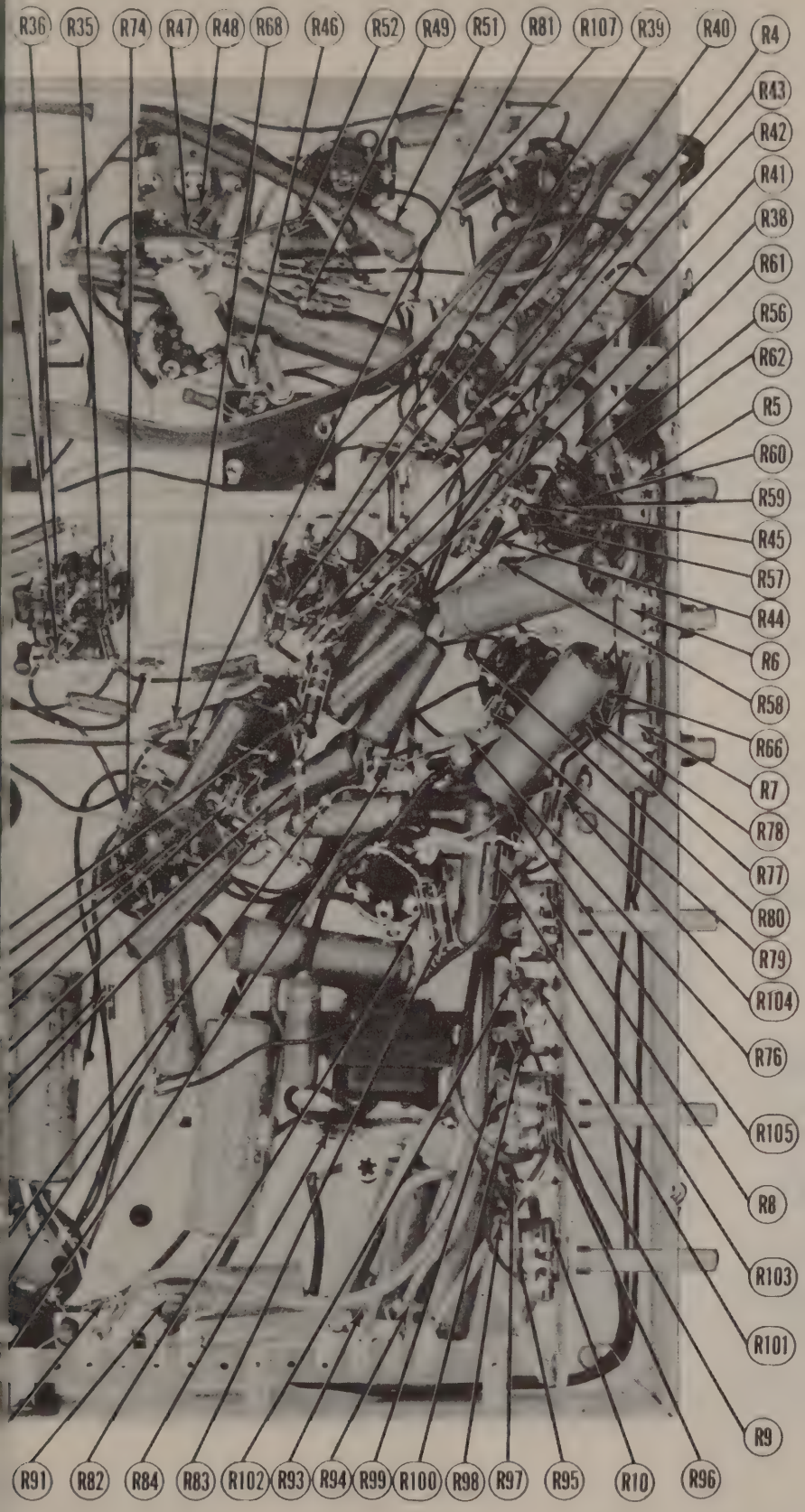
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω		A-201-15676		
L3	High Band Antenna	0Ω				Consists of No. 18 straight, bare, tinned copper wire.
L4	Low Band Antenna	0Ω				Consists of No. 18 straight, bare, tinned copper wire.
L5	RF Choke	.2Ω		A-16A-16637		
L6	RF Choke	.2Ω		A-16A-16637		
L7	Low Band RF	0Ω		B-13E-12046		
L8A	High Band RF	0Ω		A-201-15675		Uses core with green end.
B	High Band RF	0Ω		B-13D-12155		Uses core with red end.
L9	Low Band RF	0Ω		B-13E-12046		
L10A	High Band RF	0Ω		A-201-15675		Uses core with green end.
B	High Band RF	0Ω		B-13D-12155		Uses core with red end.
L11	RF Choke	.2Ω		A-16A-16637		
L12	Low Band Osc.	0Ω		B-13D-12155		
L13	High Band Osc.	0Ω		A-13D-12045		
L14	RF Choke	.2Ω		A-16A-16637		
L15	RF Choke	.2Ω		A-16A-16637		
L16	1st IF	.1Ω		B-201-15612		
L17	2nd IF	.1Ω		B-201-15612		
L18	3rd IF	.1Ω		B-201-15612		
L19	4th IF	.1Ω		B-201-15945		
L20	RF Choke	1.5Ω		A-16A-16637		
L21	RF Choke	1.5Ω		A-16A-16637		
L22	RF Choke	1.5Ω		A-201-15608		
L23	RF Choke	1.5Ω		A-16A-16637		
L24	RF Choke	1.5Ω		A-16A-16637		
L25	Peaking	7.2Ω		A-201-16170		
L26	Peaking	22Ω		A-201-16172		
L27	Peaking	9Ω		A-201-16171		
L28	Sound Take-Off Trans.	.5Ω	.5Ω	C-201-16155		
L29	Ratio Det. Trans.	4Ω	.5Ω	C-201-15717		
L30	RF Choke	24.5Ω		A-201-15556		
L31	RF Choke	20Ω		B-16A-13524		
L32	Fil. Choke	1.5Ω		A-16A-16637		
L33	Fil. Choke	1.5Ω		A-16A-16637		
L34	RF Choke	0Ω		A-201-16379		
L35	Fil.Choke	1.5Ω		A-16A-16637		Not used in all models.

SELENIUM RECTIFIER

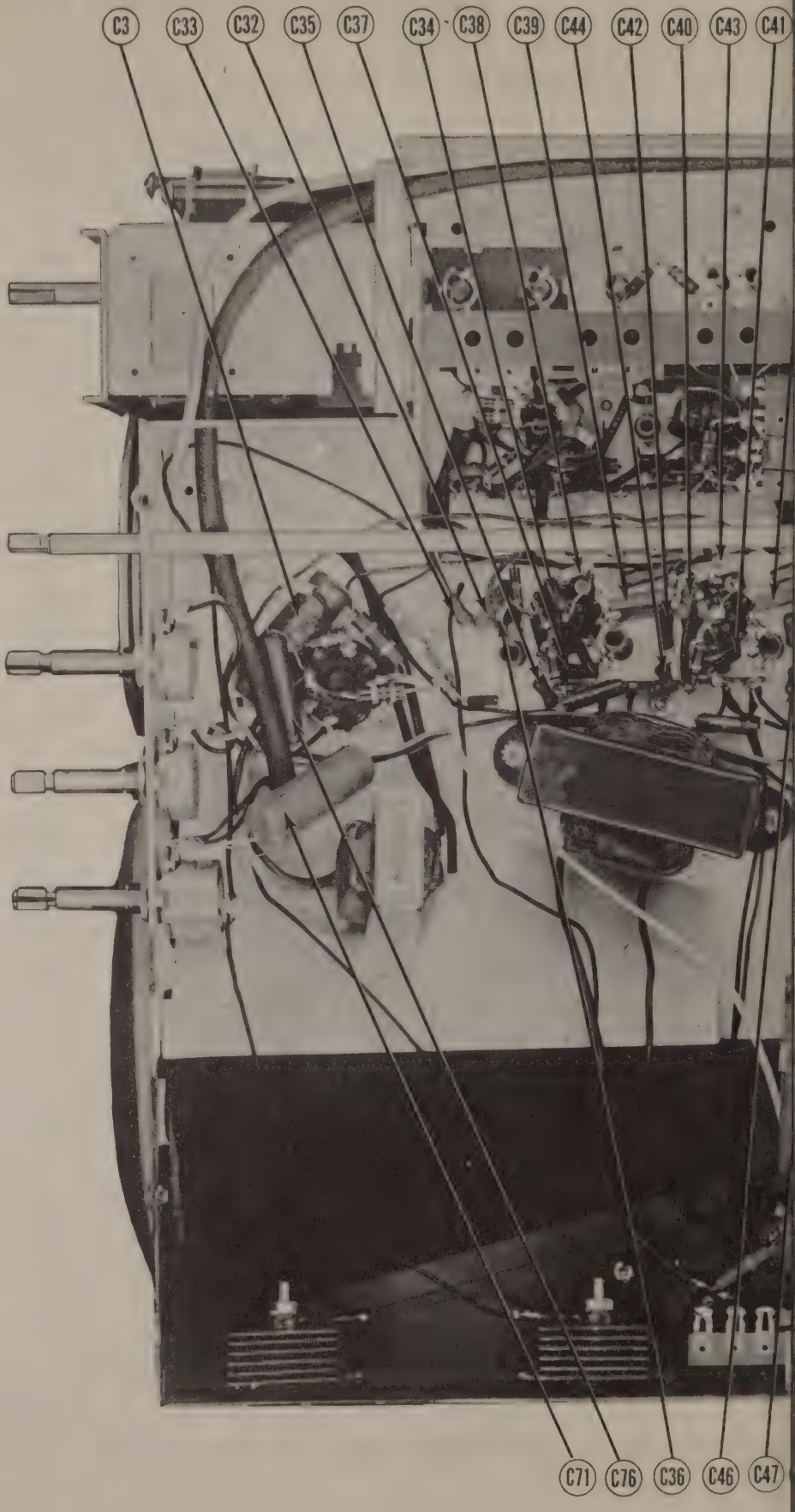
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	CORONADO PART No.			
M1	.105A	B-21J-15661			
M2	.105A	B-21J-15661			

MISCELLANEOUS

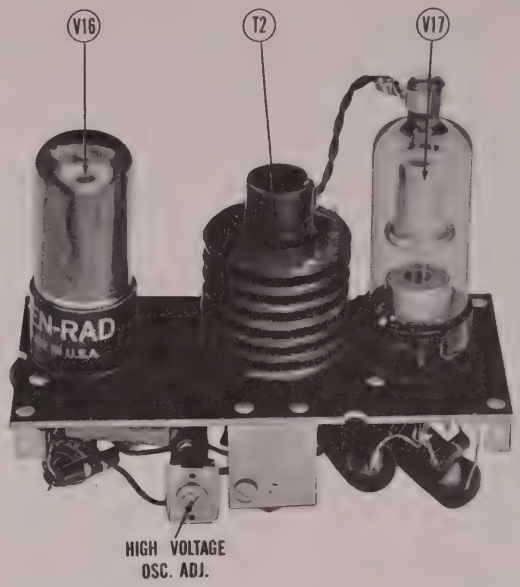
ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Ballast Tube	B-9M-15822	
	Iron Core	A-51A-16693	For L19
	Knob	B-5B-15759-57	For station selector
	Knob	B-5B-15782-57	For contrast, Hor. Hold, Vert. Hold and on-off vol.
	Safety Glass	C-30M-15905	
	Iron Core	A-51A-15713	For L12 and L13
	Iron Core	A-51A-15714	For L8 and L10 having green end.
	Iron Core	A-51A-16391	For L8 and L10 having red end.
	Iron Core	A-51A-15715	For L7 and L9
	Core Mounting Clip	A-2M-16276	



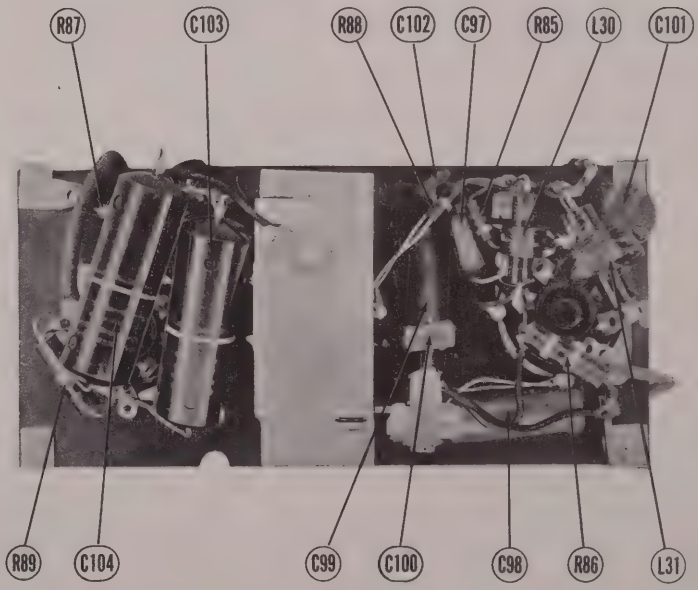
ESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-

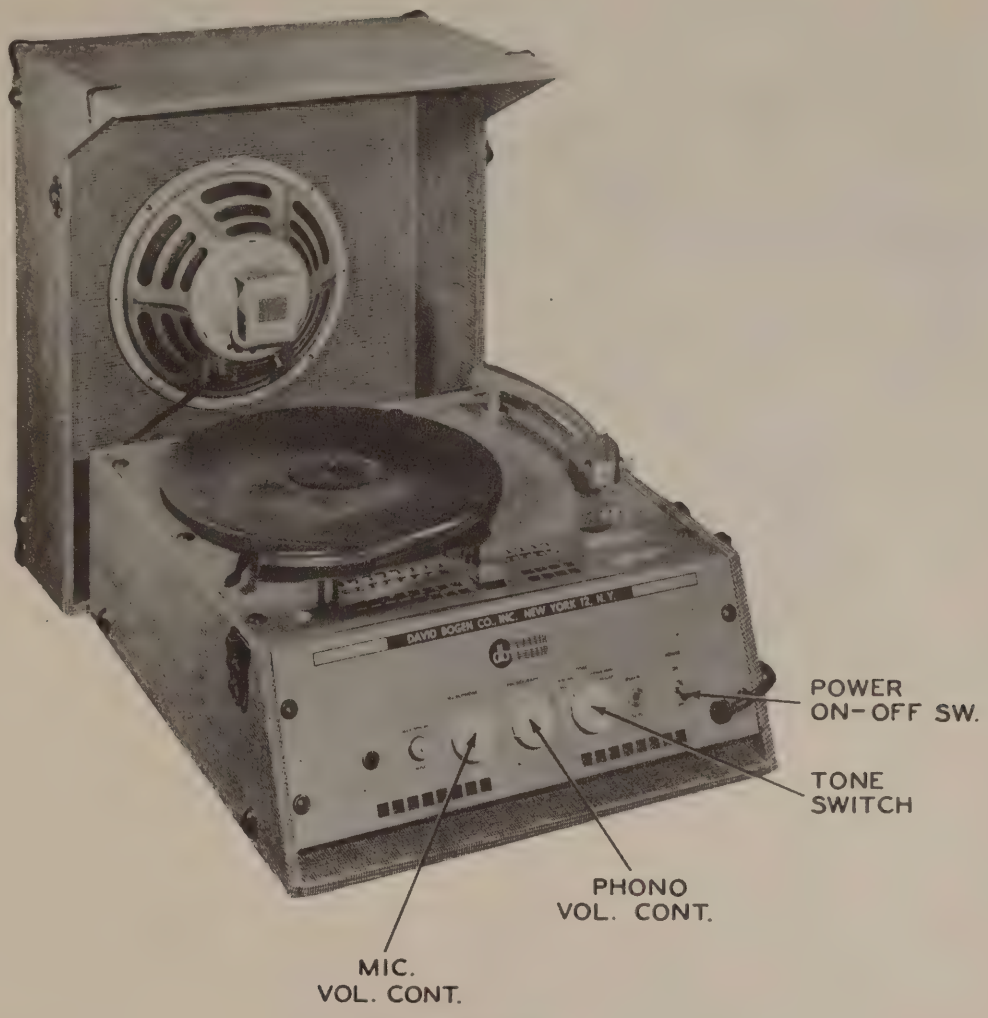


HIGH VOLTAGE SUPPLY - TOP VIEW



HIGH VOLTAGE SUPPLY - BOTTOM VIEW

DAVID BOGEN
MODELS LP16, UP16



DAVID BOGEN
MODELS LP16, UP16

DAVID BOGEN MODEL LP16

TRADE NAME	David Bogen, Models LP16, UP16
MANUFACTURER	David Bogen Co., Inc., 663 Broadway, New York 12, New York
TYPE SET	AC Operated Phonograph with 5 Tube Audio Amplifier
TUBES(SEVEN)	Types 6SJ7 Mic. Pre. Amp., 6SL7GT AF-Phase Inverter, (2) 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .56 Amp. at 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Mic. Pre Amp.	6SJ7	6SJ7	8N	
V2	AF Amp. -Phase Inverter	6SL7GT	6SL7GT	8BD	
V3	Power Output	6V6GT	6V6GT	7AC	
V4	Power Output	6V6GT	6V6GT	7AC	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	10	450		AF22J	UP5Q45		EL-210	▲ Filter
B	10	450						▲ Filter
C2A	10	450		AF22J	UP5Q45		EL-210	▲ Decoupling
B	10	450						▲ Decoupling
C3	50	50		PRS50/50	BR505		TVA-16	Output Cath. Bypass
C4	50	50		PRS50/50	BR505		TVA-16	AF Amp. Cath. Bypass
C5	.02	600		P688-02	GT6S2		TM-12	Audio Coupling
C6	.02	600		P688-02	GT6S2		TM-12	Pre-Amp. Screen Bypass
C7	.05	400		P488-05	GT4S5		TM-15	Audio Coupling
C8	350	500		1468-00035	5W5T35	GP2K-330	1FM-335	Tone Compensation
C9	.05	400		P488-05	GT4S5		TM-15	Audio Coupling
C10	.05	400		P488-05	GT4S5		TM-15	Audio Coupling
C11	5	500		1468-000005	5W5V5		MS-55	Tone Compensation
C12	.03	400		P488-03	GT4S3		TM-13	Tone Compensation
C13	.006	600		P688-006	GT6D6		TM-26	Tone Compensation
C14	.02	600		P688-02	GT6S2		TM-12	Tone Compensation
C15	.05	400		P488-05	GT4S5		TM-15	Tone Compensation
C16	.1	500		P688-1	GT6P1		TM-1	Line Filter

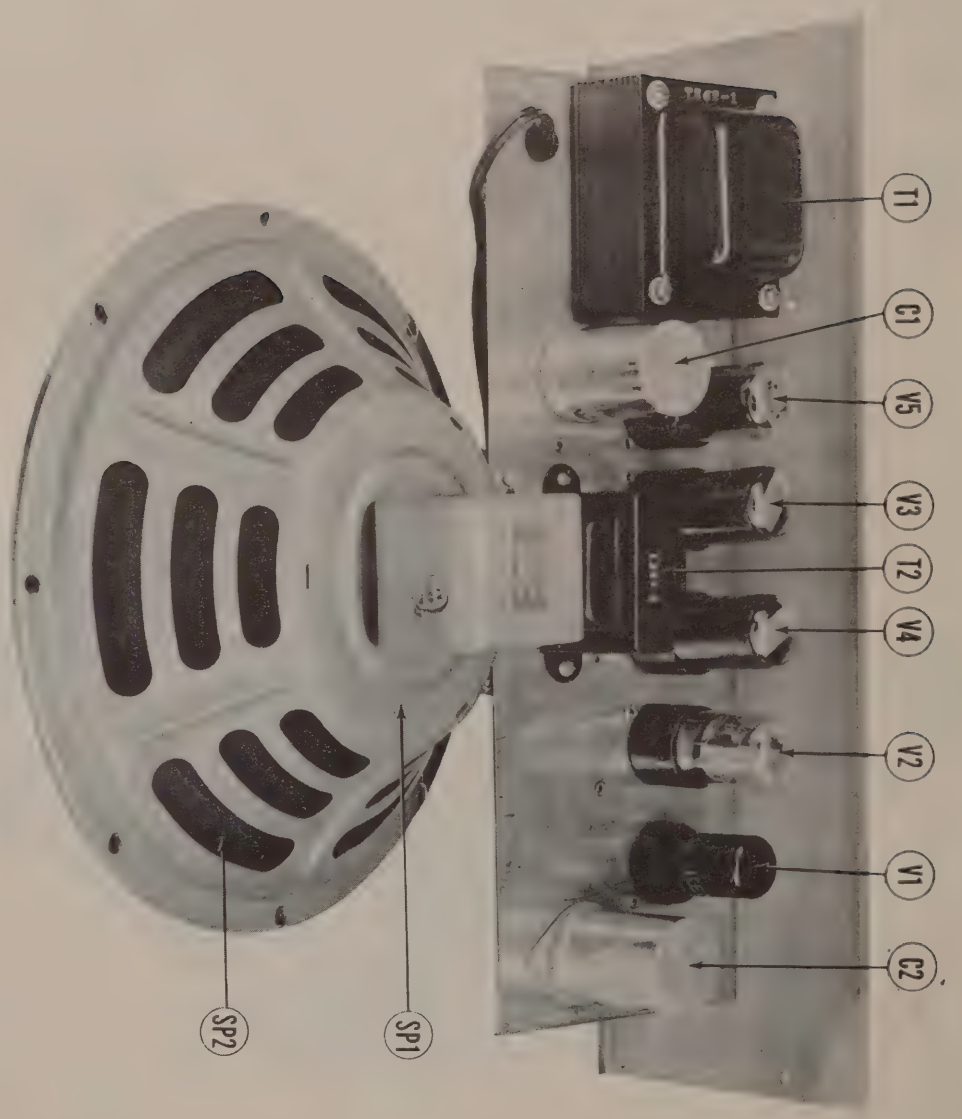
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: D. BOGEN PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1	500KΩ	½	V-202A	Q13-133	M-60-Z	Microphone Volume Control
R2	500KΩ	½	V-202A	Q13-133	M-60-Z	Phono Volume Control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R3	2.2 Meg.	½		BTS-2.2 Meg.	Mic. Pre Amp. Grid
R4	470KΩ	½		BTS-470K	Mic. Pre Amp. Plate
R5	2.2 Meg.	½		BTS-2.2 Meg.	Mic. Pre Amp. Screen
R6	47KΩ	½		BTS-47K	Mic. Pre Amp. Decoupling
R7	220KΩ	½		BTS-220K	Isolation
R8	3300Ω	½		BTS-3300	AF Cathode
R9	1000Ω	½		BTS-1000	AF Cathode
R10	330Ω	½		BW-½-330	AF Cathode-Wire Wound
R11	220KΩ	½		BTS-220K	AF Plate
R12	2200Ω	½		BTS-2200	Feedback
R13	3900Ω	½		BTS-3900	Phase Inv. Cathode
R14	22KΩ	½		BTS-22K	Phase Inv. Grid
R15	220KΩ	½		BTS-220K	Phase Inv. Plate
R16	470KΩ	½		BTS-470K	Output Grid
R17	470KΩ	½		BTS-470K	Output Grid
R18	250Ω	4		AB-250	Output Cathode-Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	DAVID BOGEN PART No.	IRC PART No.	
R19	4700Ω	1		BTA-4700	Decoupling
R20	100KΩ	½		BTS-100K	Feedback
R21	6800Ω	½		BTS-6800	Tone Compensation
R22	15KΩ	½		BTS-15K	Tone Compensation
R23	15KΩ	½		BTS-15K	Tone Compensation
R24	2200Ω	½		BTS-2200	Tone Compensation
R25	150Ω	½		BW-½-150	Tone Compensation
R26	500Ω	10		AB-500	Filter-Wire Wound
R27	250Ω	4			Surge Limiter-Wire Wound
R28	4.7Ω	½		BW-½-4.7	Series Dial Lamp-Wire Wound

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at .56A	740VCT .072ADC	5VAC at 2A	6.3VCT at 1.7A	T362-1	P-6012	P-2952	PH-70B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	7300Ω CT	7Ω	385Ω CT	.5Ω	T265-2	A-3824	A-2904 †	RO-305	† Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			DAVID BOGEN PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-120		
SP1	PM	7Ω		MOD. P10-S	10A6	
	CONE DIA.	V. C. DIA.				
SP2	9 3/8"	1"				

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					DAVID BOGEN PART No.		
M1	Bayonet	6-8	.15	Brown			Type #47

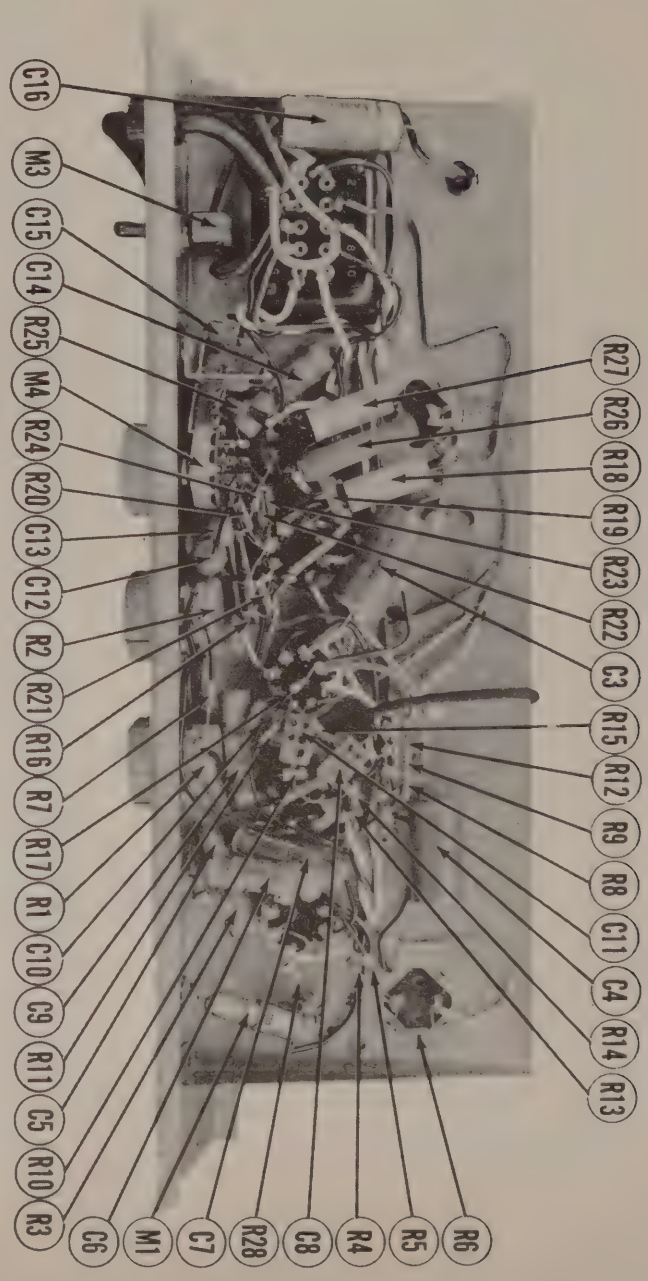
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA		REMARKS
	David Bogen PART No.	ASTATIC PART No.	
M2A B		L70A QT3-J	Model LP16 Models LP16 and UP16

MISCELLANEOUS

ITEM No.	PART NAME	DAVID BOGEN PART No.	NOTES
M3	Switch		Power
M4	Switch		Tone

CHASSIS—BOTTOM VIEW

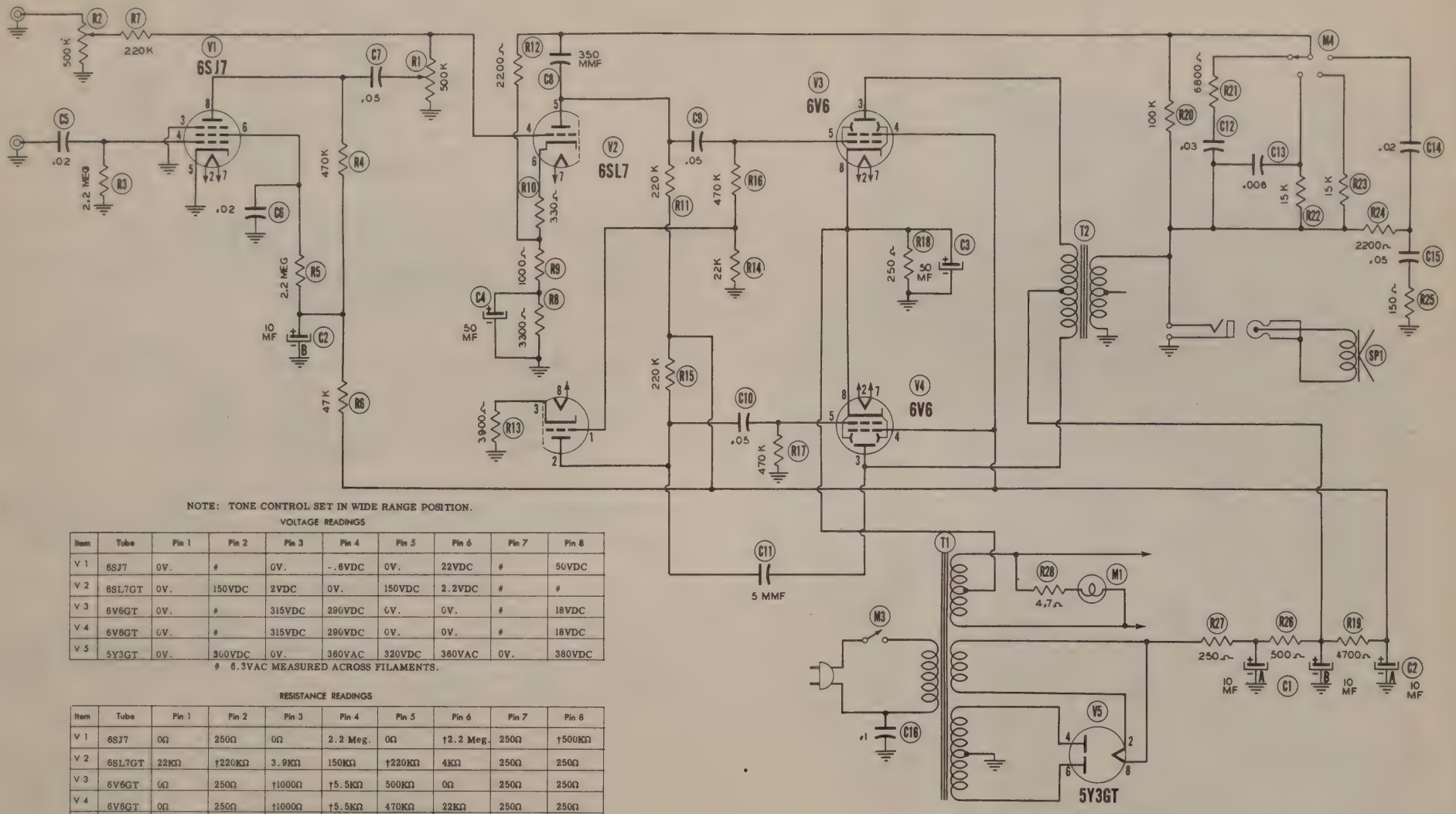


SET 86

FOLDER 4

DAVID BOGEN MODEL LP16

DAVID BOGEN MODEL LP16



NOTE: TONE CONTROL SET IN WIDE RANGE POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0V.	#	0V.	-.6VDC	0V.	22VDC	#	50VDC
V 2	6SL7GT	0V.	150VDC	2VDC	0V.	150VDC	2.2VDC	#	#
V 3	6V6GT	0V.	#	315VDC	290VDC	0V.	0V.	#	18VDC
V 4	6V6GT	0V.	#	315VDC	290VDC	0V.	0V.	#	18VDC
V 5	5Y3GT	0V.	360VDC	0V.	360VAC	320VDC	360VAC	0V.	380VDC

6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	250Ω	0Ω	2.2 Meg.	0Ω	†2.2 Meg.	250Ω	†500KΩ
V 2	6SL7GT	22KΩ	†220KΩ	3.9KΩ	150KΩ	†220KΩ	4KΩ	250Ω	250Ω
V 3	6V6GT	0Ω	250Ω	†1000Ω	†5.5KΩ	500KΩ	0Ω	250Ω	250Ω
V 4	6V6GT	0Ω	250Ω	†1000Ω	†5.5KΩ	470KΩ	22KΩ	250Ω	250Ω
V 5	5Y3GT	150Ω	150KΩ	Inf.	165Ω	140KΩ	175Ω	2.2KΩ	150KΩ

† MEASURED FROM PIN 8 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

PHOTOFACT* Folder

FIRESTONE MODEL 13-G-3

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

FIRESTONE MODEL 13-G-3

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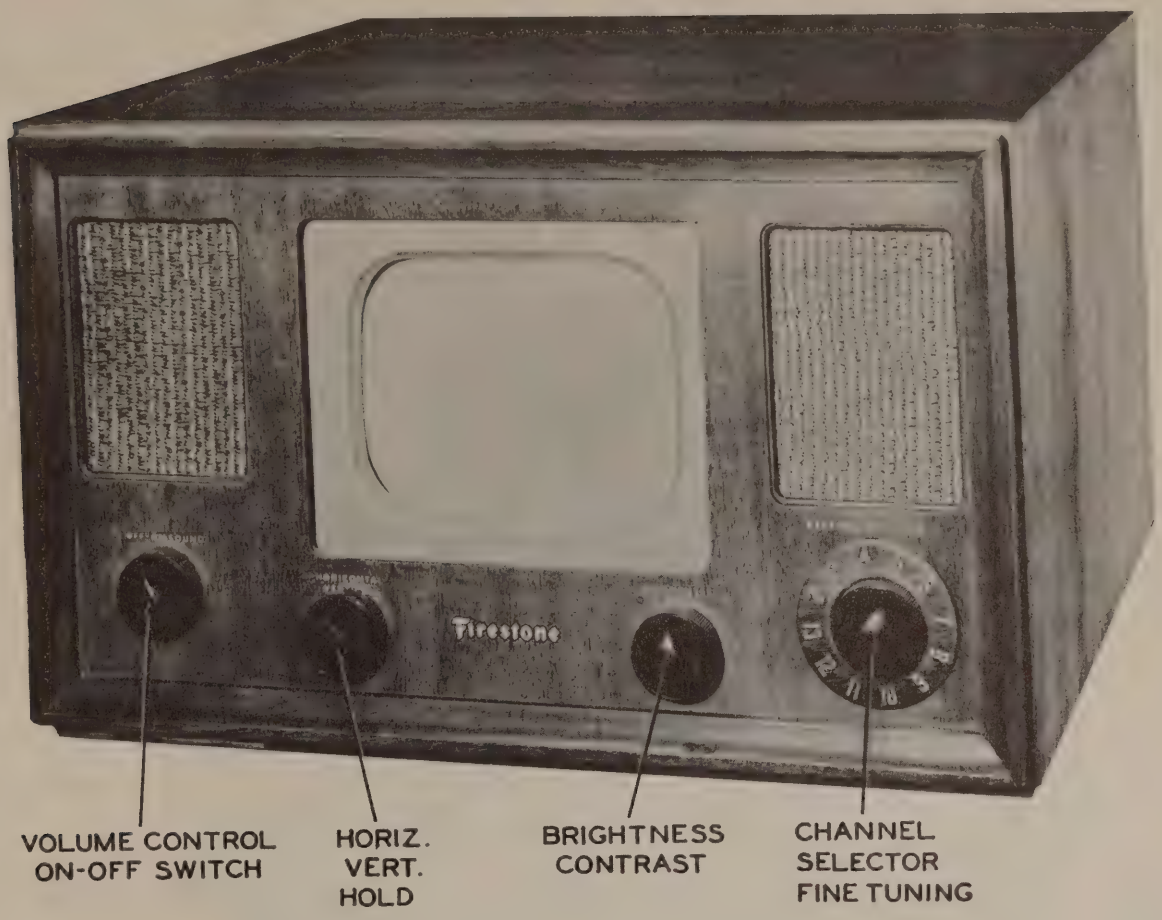
Date 2/50 Set No. 86—Folder No. 5



FIRESTONE
MODEL 13-G-3

TRADE NAME	Firestone Model 13-G-3
SUPPLIER	The Firestone Tire and Rubber Co., 1200 Firestone Pkwy., Akron, Ohio
TYPE SET	Televison Receiver
TUBES	Twenty Two
POWER SUPPLY	105 - 125 Volts AC - 60 Cycle
RATING	.95 Amp. at 117 Volts AC
TUNING RANGE–	Channels 2 thru 13

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Voltage and Resistance Measurements 8

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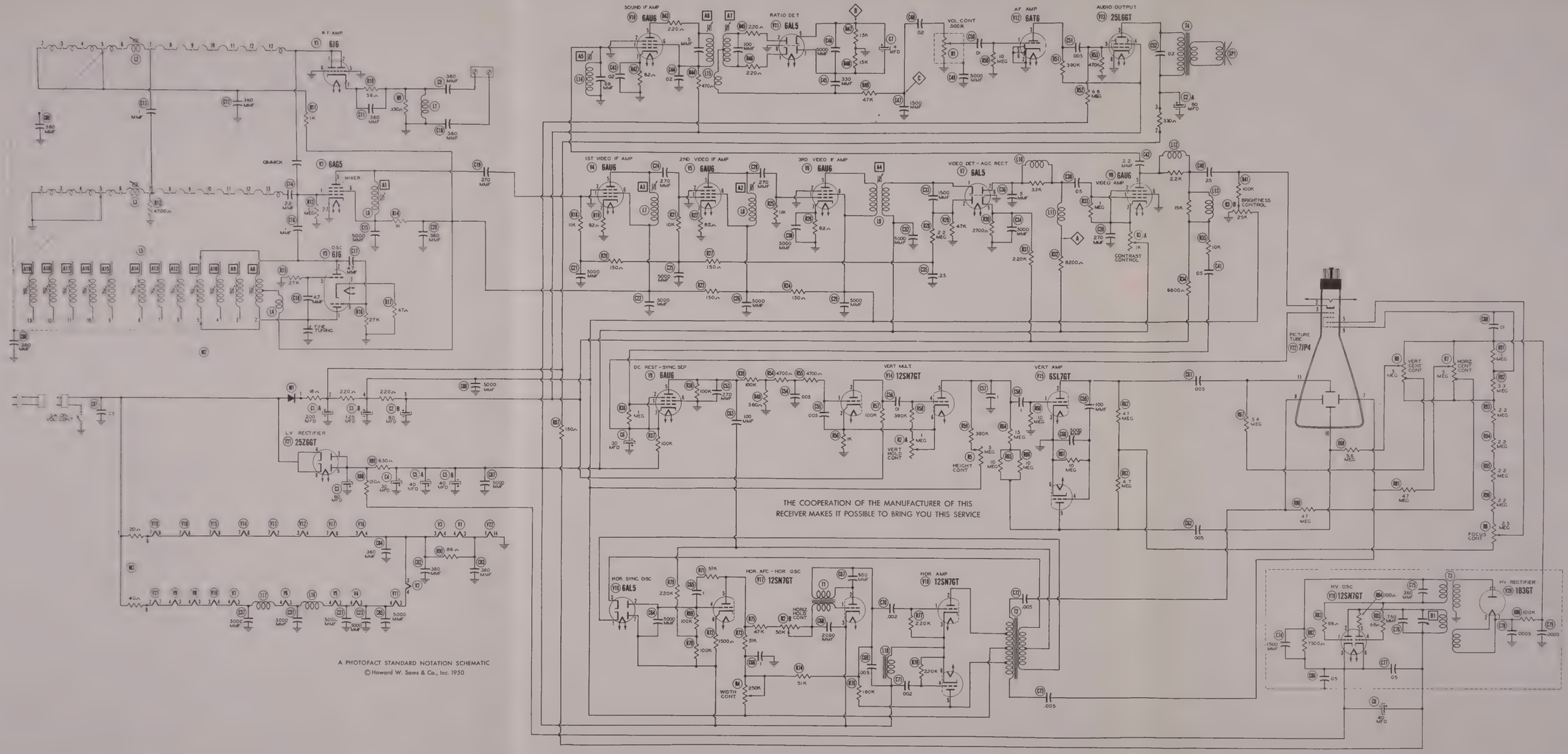

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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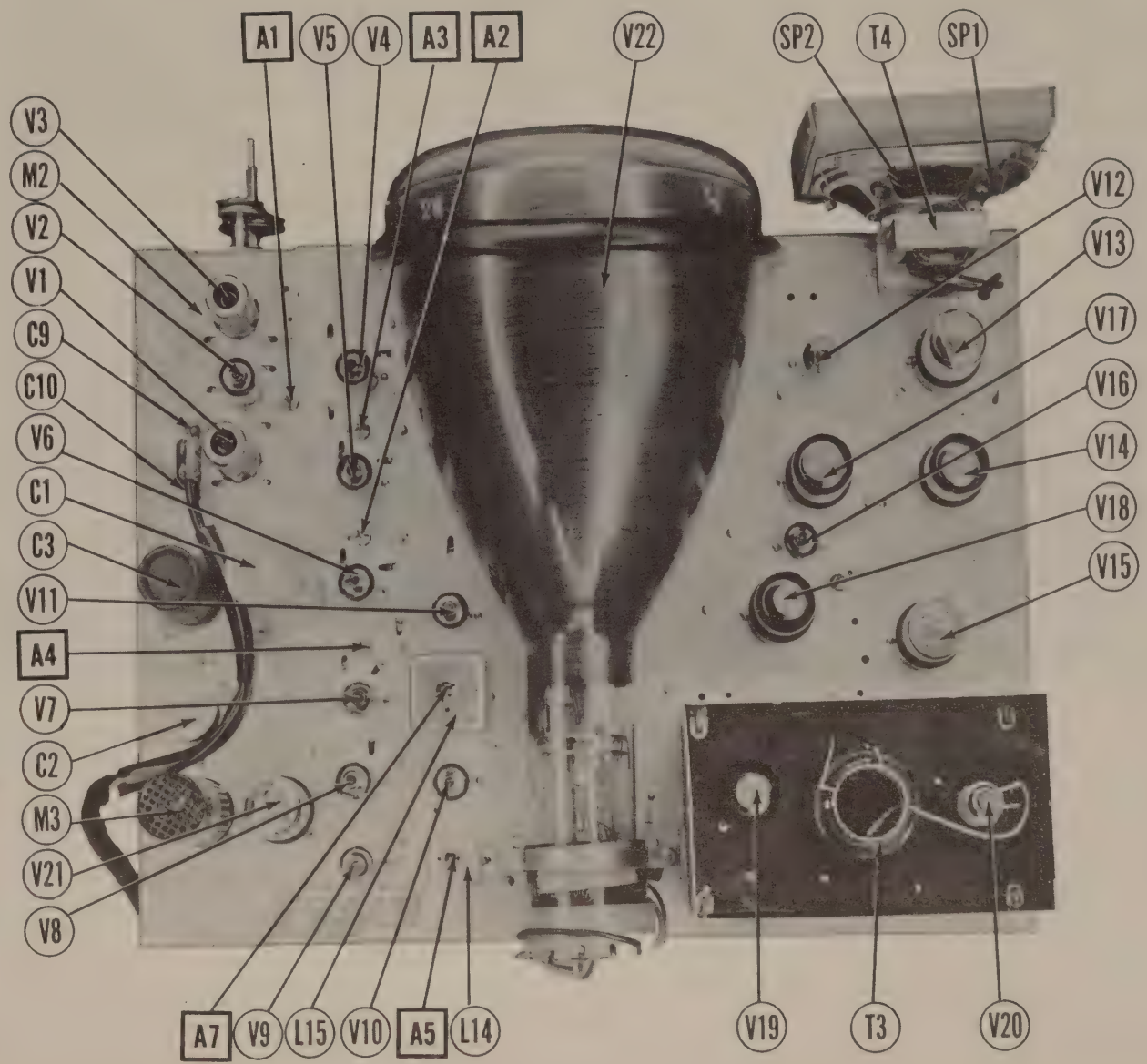
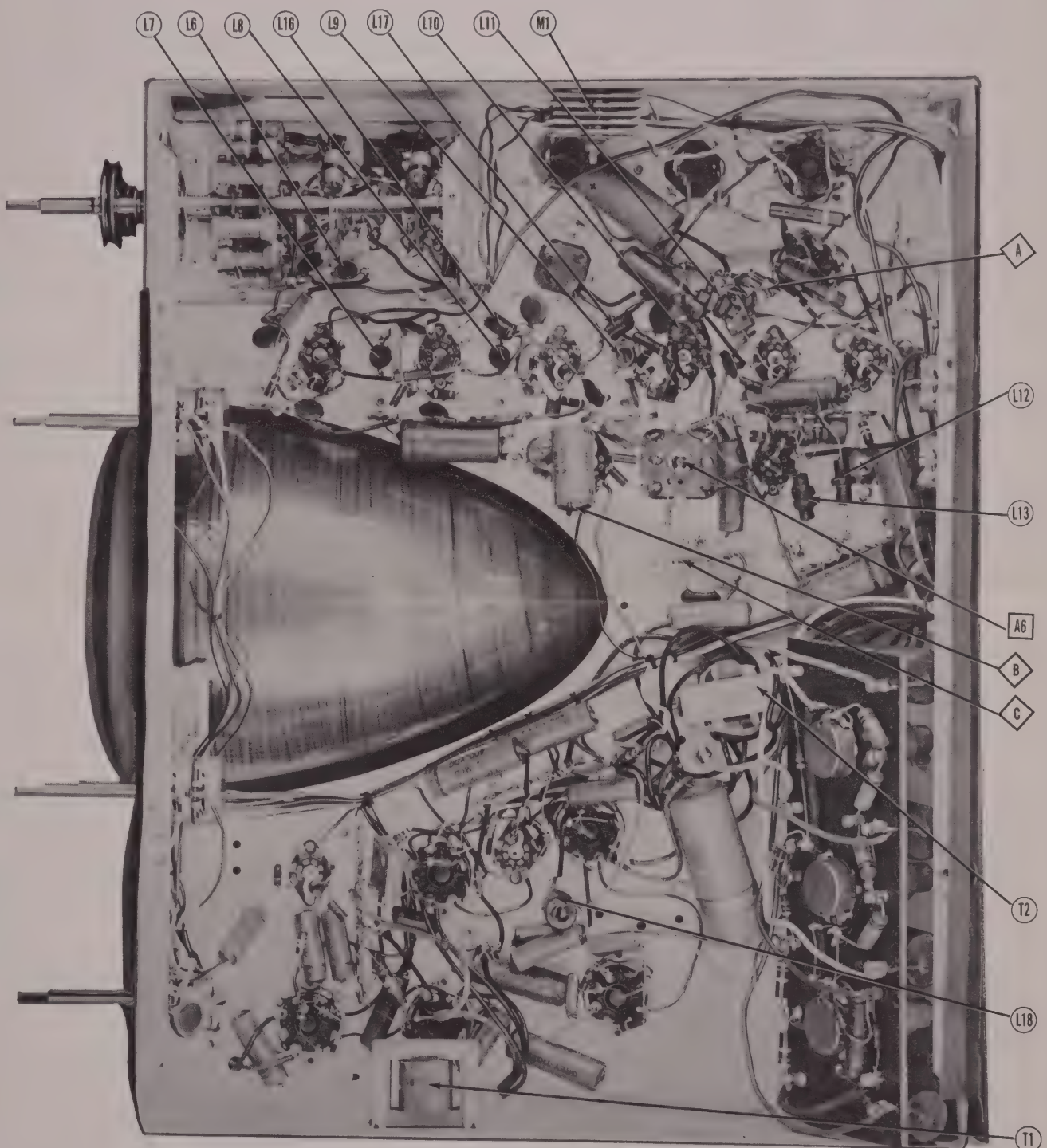
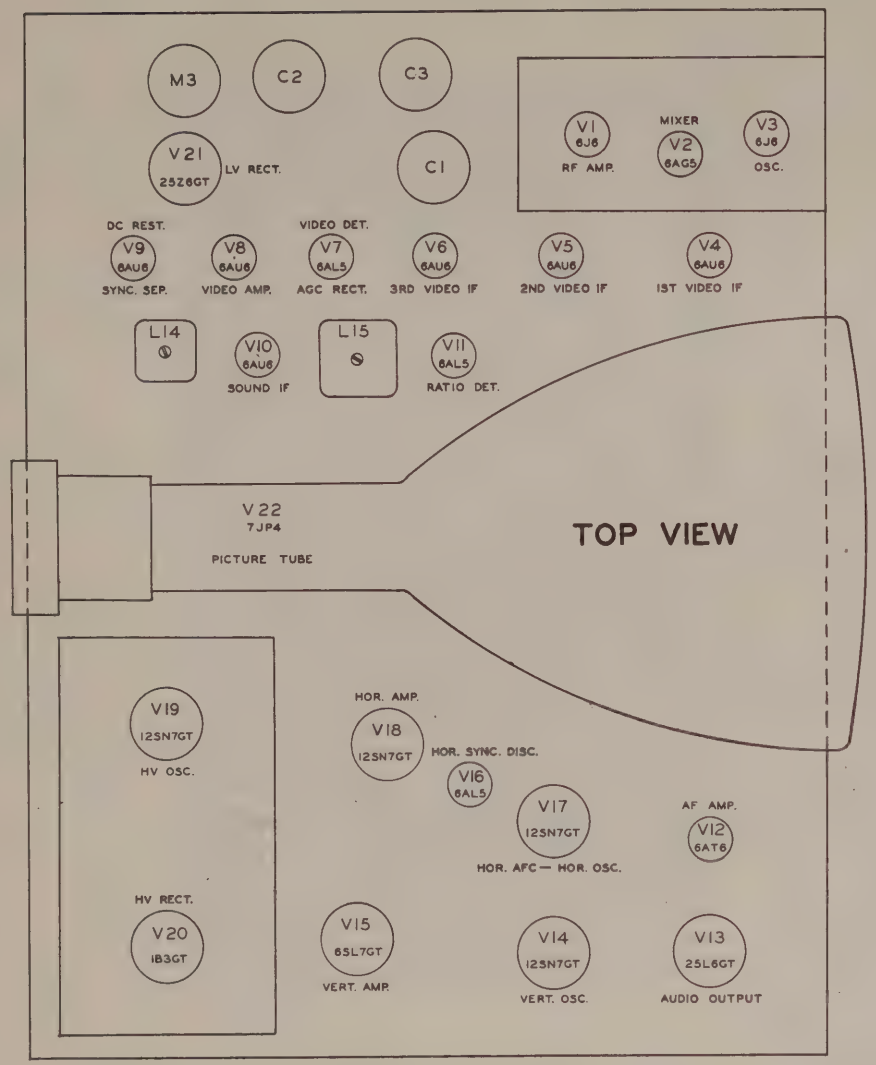
FIRESTONE
MODEL 13-G-3

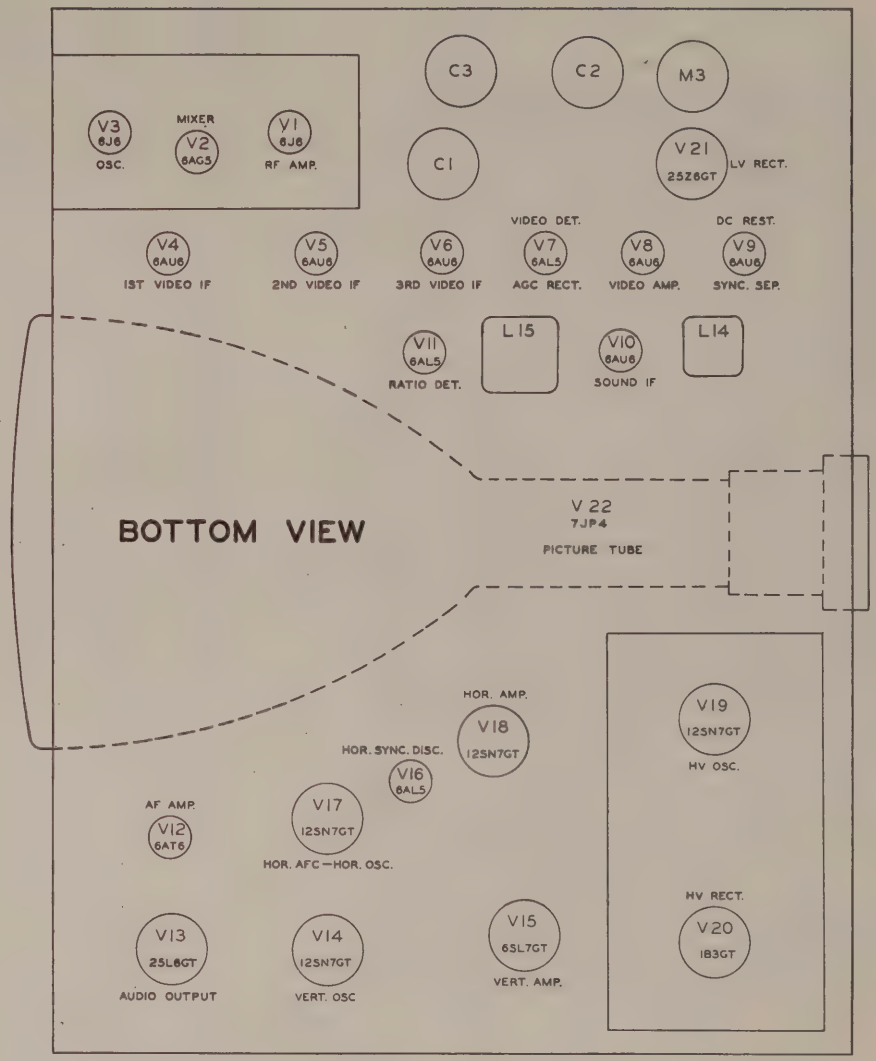


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

FIRESTONE
MODEL 13-G-3

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the picture tube is removed during alignment, short pins 1 and 14 of the picture tube socket to complete the filament circuit.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	34.8MC (Unmod.)	Any	DC Probe and common leads across R32.	A1, A2	Adjust for maximum deflection.
2.	Direct	"	36.9MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. Set the channel switch to any channel where interference from the local oscillator is minimum. To check for erroneous indications turn the fine tuning control; if the pattern on the scope changes, switch to another channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	35MC (10MC SWP)	32.6MC 34.8MC 36.9MC 37.3MC	See note above	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1 with proper marker placement. If necessary retouch A1 and A2 to correct the low frequency end, and A3 and A4 to correct the high frequency end of the response curve.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel unused locally.	DC Probe to Point (B) Common to chassis.	A5, A6	Adjust for maximum deflection.
5.	.01MFD	"	"	"	DC Probe to Point C. Common to chassis.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V8). Low side to chassis.	4.5MC (1MC SWP)	4.5MC	Any channel unused locally.	Vert. Amp. to Point (B) Low side to chassis.	A5, A6	Adjust for maximum amplitude and symmetry as per Fig 2.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A7	Adjust A7 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

The RF and mixer circuits in this tuner are pre-set at the factory and are very stable and normally should not require adjustment in the field. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to center conductor of antenna input cable. Low side to outer shield.	57MC (10MC SWP)	55.25MC 59.75MC	2	Vert. Amp. to Point (A) Low side to chassis.	A8	Adjust to place sound marker as shown in Fig 4. The video marker should fall between 45 and 60% on opposite side of response curve. If the video marker does not fall within the proper range on ALL channels, switch to channel 6 and make slight adjustments of video IF coils A1, A2, A3 and A4 to obtain proper results.
			63MC (10MC SWP)	61.25MC 65.75MC	3		A9	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A10	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A11	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A12	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A13	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A14	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A17	
			207MC (10MC SWP)	205.25MC 209.75MC	12		A18	
			213MC (10MC SWP)	211.25MC 215.75MC	13		A19	

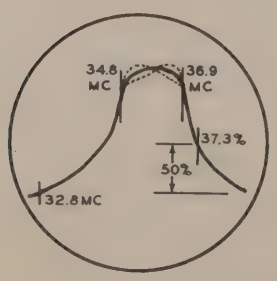


FIG. 1

FIG. 2

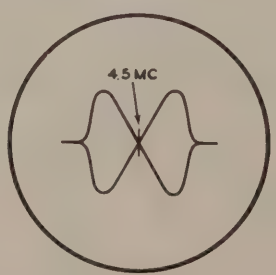


FIG. 3

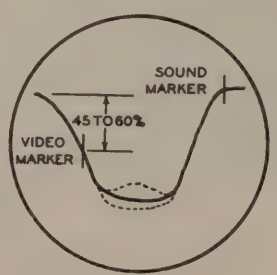
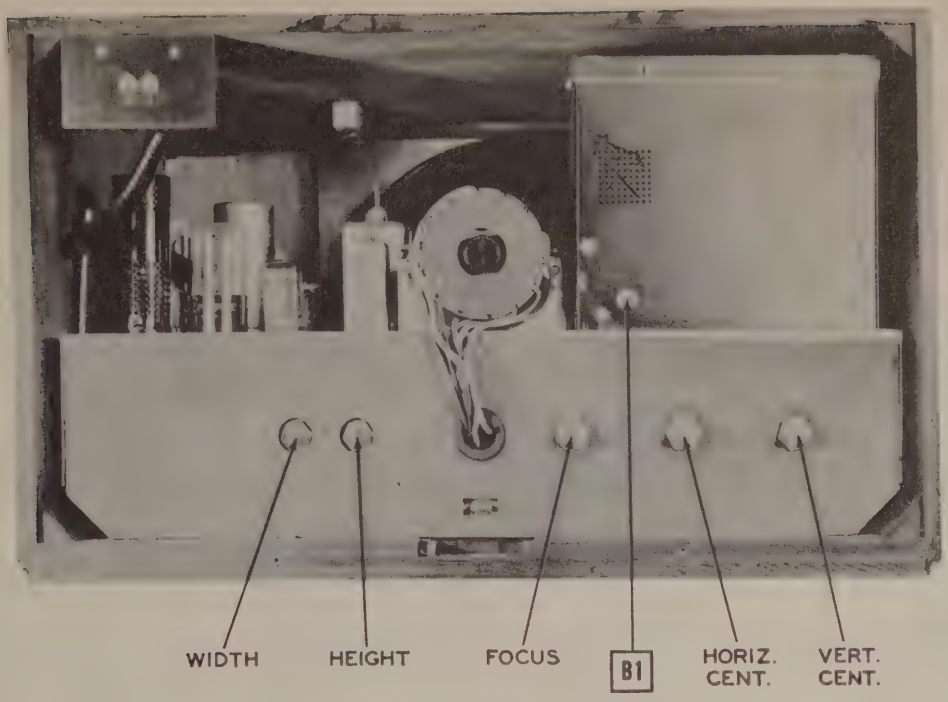


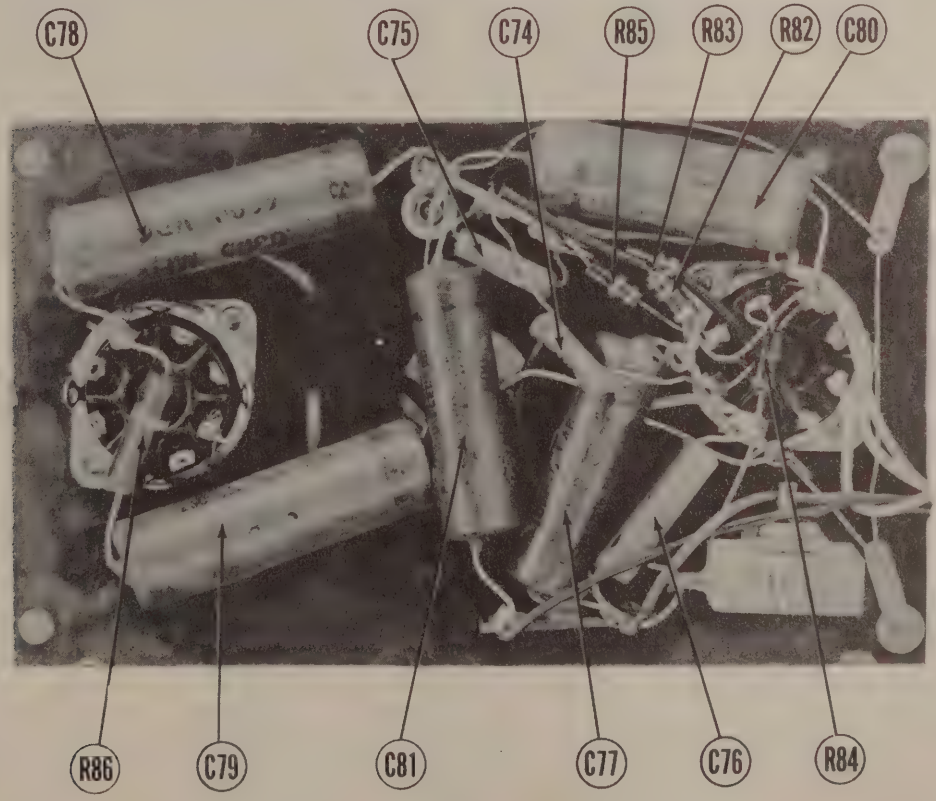
FIG. 4



CABINET–REAR VIEW

PICTURE SIZE ADJUSTMENT

The picture size trimmer (B1) which controls the high voltage is located in the high voltage power supply compartment and is used to adjust the picture to the proper horizontal width. Due to the interaction between the circuits, it will be necessary to adjust the height control when B1 is changed.



HIGH VOLTAGE SUPPLY–BOTTOM VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	75VDC	75VDC	6.3VAC	13VAC	0V.	0V.	.7VDC		
V 2	6AG5	-1VDC	0V.	19.5VAC	27VAC	80VDC	80VDC	0V.		
V 3	6J6	85VDC	85VDC	19.5VAC	13VAC	§-2.3VDC	§-2VDC	.4VDC		
V 4	6AU6	-.2VDC	0V.	33VAC	40VAC	87VDC	87VDC	.6VDC		
V 5	6AU6	-.2VDC	0V.	40VAC	48VAC	90VDC	90VDC	.5VDC		
V 6	6AU6	0V.	0V.	48VAC	54VAC	90VDC	90VDC	.7VDC		
V 7	6AL5	-100VDC	0V.	54VAC	60VAC	1VDC	0V.	-100VDC		
V 8	6AU6	#.4VDC	#10VDC	66VAC	74VAC	#135VDC	#100VDC	#10VDC		
V 9	6AU6	#10VDC	#68VDC	74VAC	80VAC	#80VDC	#100VDC	#68VDC		
V 10	6AU6	0V.	0V.	66VAC	60VAC	80VDC	80VDC	.7VDC		
V 11	6AL5	0V.	0V.	26VAC	33VAC	1.4VDC	0V.	-.2VDC		
V 12	6AT6	-.4VDC	0V.	44.5VAC	38VAC	0V.	0V.	36VDC		
V 13	25L6GT	100VDC	44.5VAC	90VDC	85VDC	-2VDC	-100VDC	70VAC	0V.	
V 14	12SN7GT	-.1VDC	19.5VDC	.6VDC	-.3VDC	2VDC 23VDC	.6VDC	82VAC	70VAC	
V 15	6SL7GT	-.7VDC	80VDC	0V.	-.4VDC	85VDC	0V.	88VAC	82VAC	
V 16	6AL5	-100VDC	-105VDC	26VAC	19.5VAC	-100VDC	0V.	-100VDC		
V 17	12SN7GT	#-11VDC	#25VDC #55VDC	#0V.	#-.6VDC	#10VDC #64VDC	#1.3VDC	38VAC	26VAC	
V 18	12SN7GT	#-2.1VDC	#192VDC	#1VDC	#-.7VDC	#187VDC	#1VDC	100VAC	88VAC	
V 19	12SN7GT	¶70VDC	¶250VDC	¶2.8VDC	¶70VDC	¶250VDC	¶2.8VDC	112VAC	100VAC	
V 20	1B3GT	* DO NOT MEASURE								
V 21	25Z6GT	-110VDC	105VAC	-110VDC	117VAC	-110VDC	100VDC	80VAC	117VAC	

V 22	7JP4	PIN 1	PIN 2	PIN 3	PIN 5	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 14
		6.3VAC	87VDC	#68VDC	*	*	*	*	*	*	0V.

§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM PIN 3 OF V17.
¶ MEASURED FROM PIN 3 OF V21.
* DO NOT MEASURE.

RESISTANCE READINGS

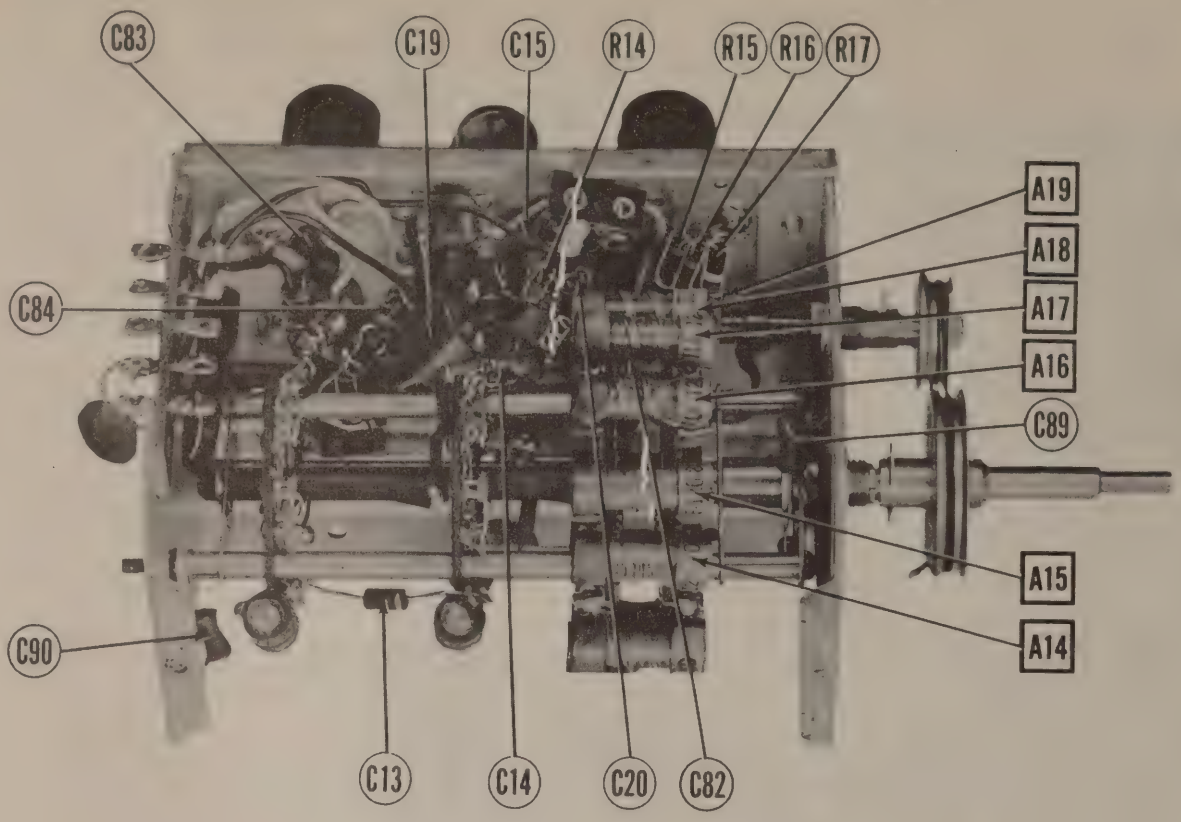
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†1.4KΩ	†1.4KΩ	1Ω	3Ω	0Ω	0Ω	56Ω		
V 2	6AG5	1 Meg.	0Ω	5.5Ω	10Ω	†1.4KΩ	†1.4KΩ	0Ω		
V 3	6J6	†390Ω	†390Ω	5.5Ω	3Ω	27KΩ	27KΩ	47Ω		
V 4	6AU6	2.3 Meg.	0Ω	13Ω	15Ω	†390Ω	†390Ω	82Ω		
V 5	6AU6	2.3 Meg.	0Ω	15Ω	18Ω	†240Ω	†240Ω	82Ω		
V 6	6AU6	11KΩ	0Ω	18Ω	20Ω	†240Ω	†240Ω	82Ω		
V 7	6AL5	#.1Ω	47KΩ	20Ω	23Ω	2.7KΩ	0Ω	#8.2KΩ		
V 8	6AU6	#1 Meg.	#1000Ω	25Ω	27Ω	†7.2KΩ	0Ω	#1000Ω		
V 9	6AU6	#1 Meg.	#100KΩ	27Ω	30Ω	50KΩ	0Ω	#100KΩ		
V 10	6AU6	1.5Ω	0Ω	25Ω	23Ω	†1.2KΩ	†1000Ω	82Ω		
V 11	6AL5	Inf.	Inf.	10Ω	13Ω	15KΩ	0Ω	15KΩ		
V 12	6AT6	10 Meg.	0Ω	17.5Ω	14Ω	0Ω	0Ω	†390KΩ		
V 13	25L6GT	†360Ω	17.5Ω	†625Ω	†450Ω	400KΩ	#0Ω	26Ω	0Ω	
V 14	12SN7GT	10KΩ	†100KΩ	1000Ω	1.5 Meg.	†5 Meg. †400KΩ	1000Ω	30Ω	26Ω	
V 15	6SL7GT	10 Meg.	†17 Meg.	0Ω	10 Meg.	†17 Meg.	0Ω	32Ω	30Ω	
V 16	6AL5	#320KΩ	#200KΩ	9Ω	5.5Ω	#320KΩ	Inf.	#0Ω		
V 17	12SN7GT	†100KΩ	†130KΩ †40KΩ	#0Ω	#200KΩ	†180KΩ †52KΩ	#1.5KΩ	14Ω	9Ω	
V 18	12SN7GT	#220KΩ	†415Ω	#34Ω	#220KΩ	†415Ω	#34Ω	35Ω	32Ω	
V 19	12SN7GT	¶7.5KΩ	†170Ω	¶150Ω	¶7.5KΩ	†270Ω	¶150Ω	38Ω	35Ω	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP 850Ω
V 21	25Z6GT	700KΩ	38Ω	700KΩ	45Ω	700KΩ	†160Ω	30Ω	45Ω	

V 22	7JP4	PIN 1	PIN 2	PIN 3	PIN 5	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 14
		1Ω	120KΩ	#100KΩ	♦12 Meg. ♦10 Meg.	♦6 Meg.	♦6 Meg.	♦1 Meg.	♦6.5Meg. ♦5.6Meg.	♦7.5Meg.	0Ω

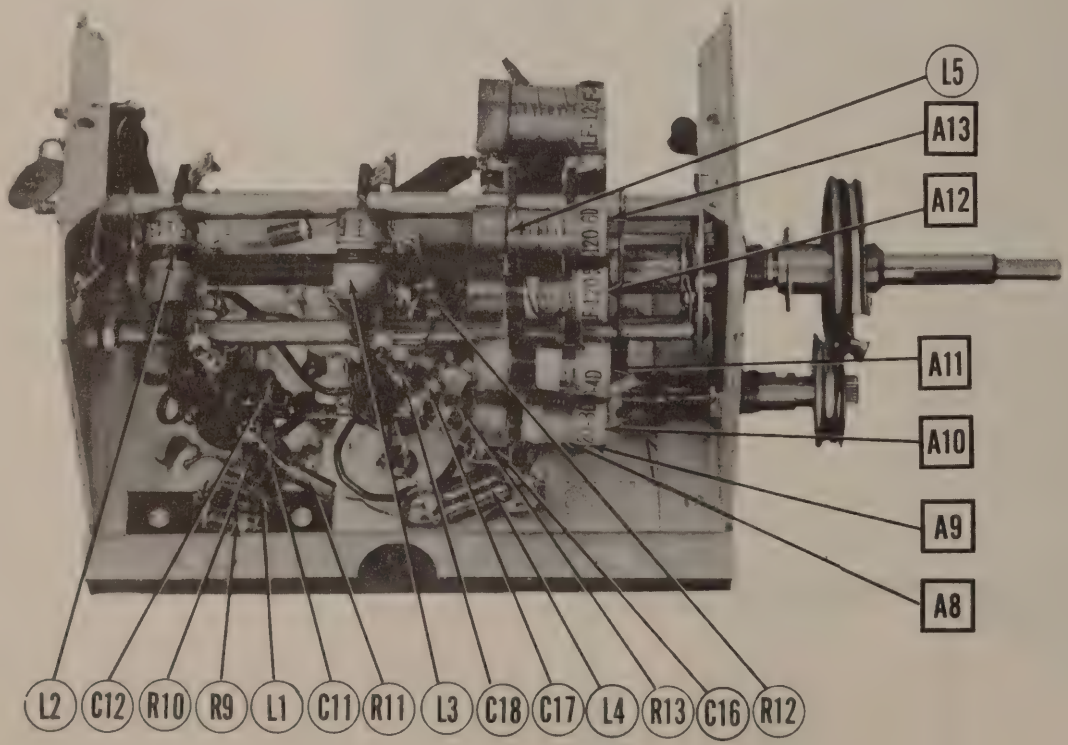
† MEASURED FROM PIN 1 OF M3.
# MEASURED FROM PIN 3 OF V17.
♦ MEASURED FROM PIN 7 OF V20
¶ MEASURED FROM PIN 3 OF V21.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

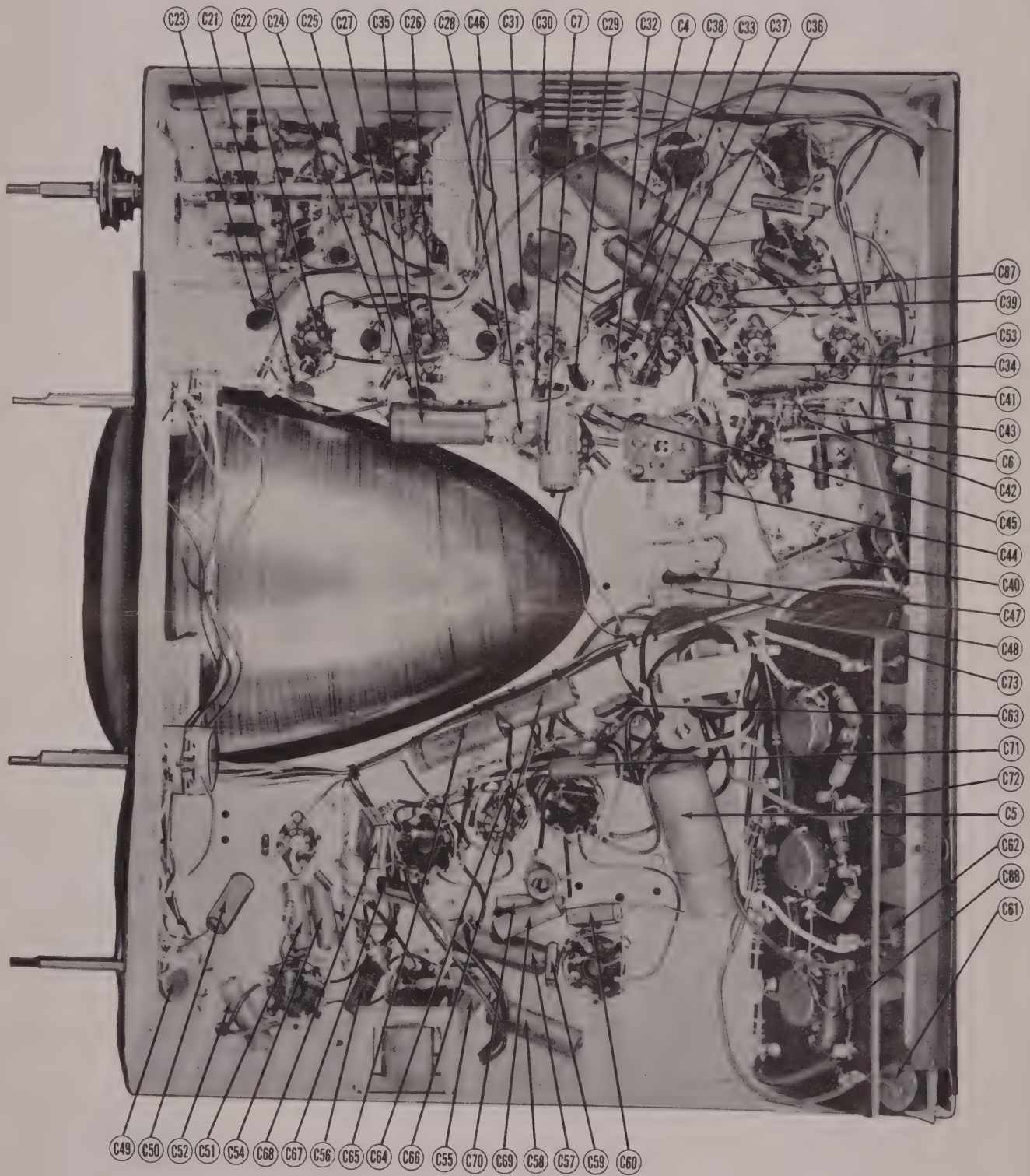
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



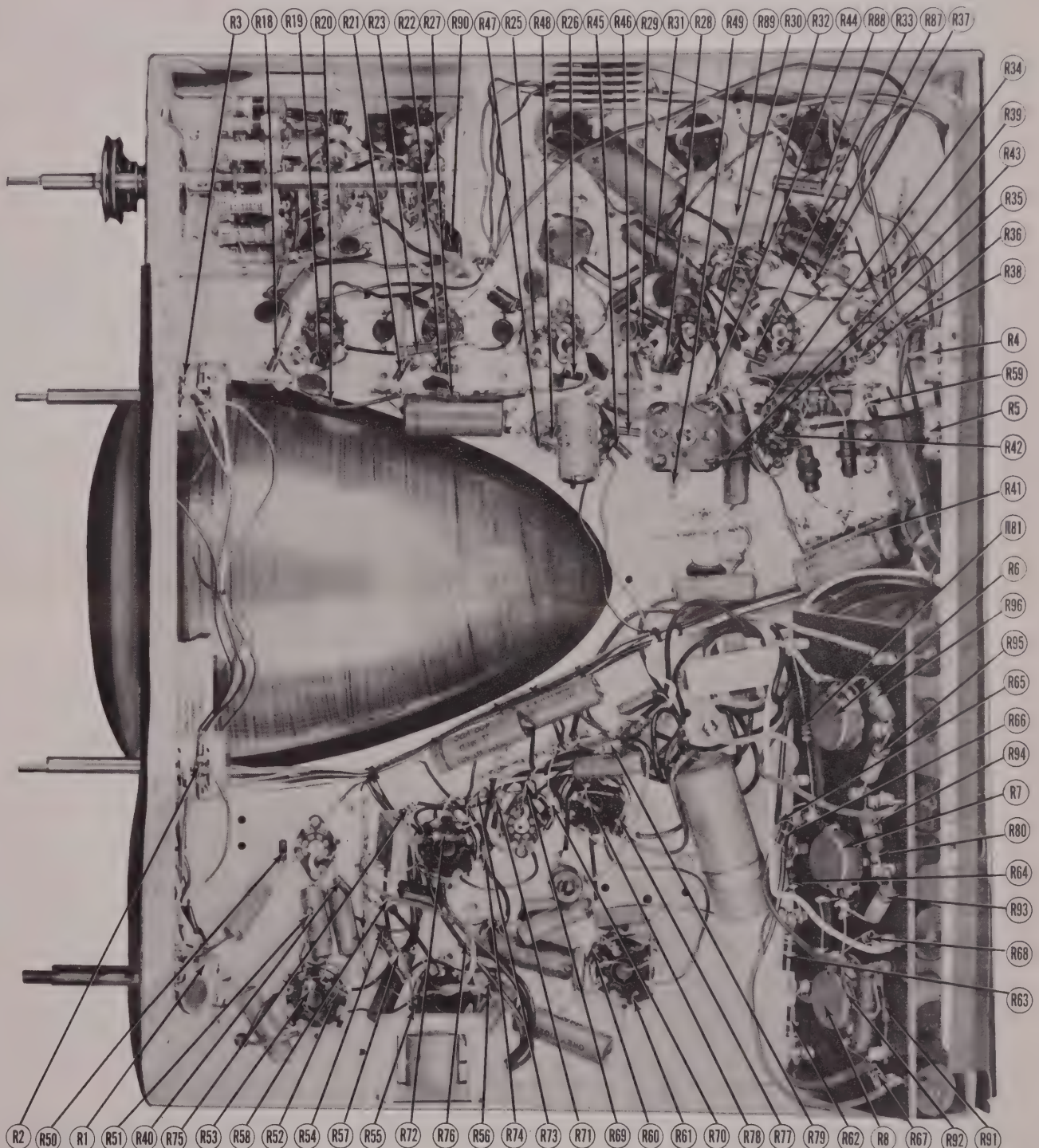
RF TUNER



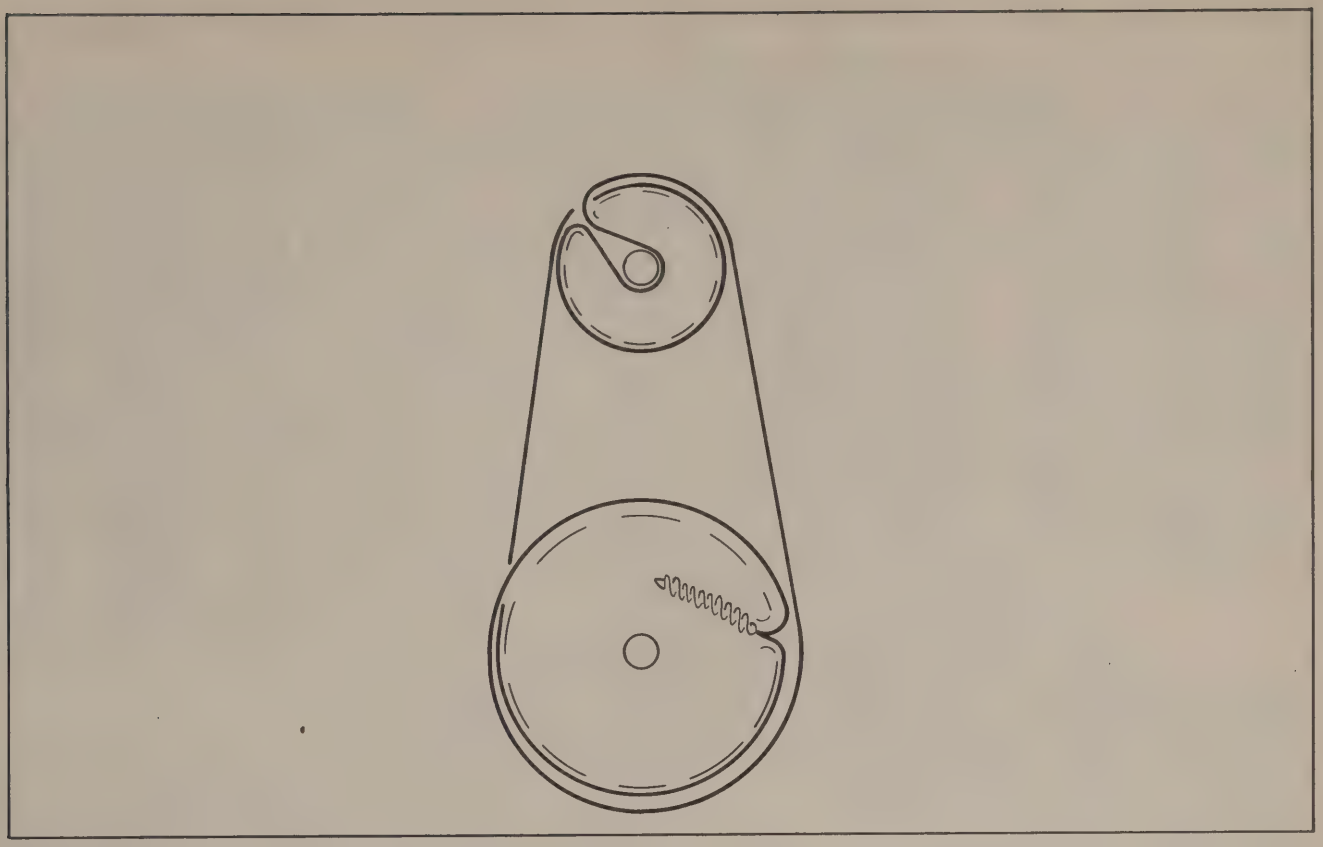
RF TUNER



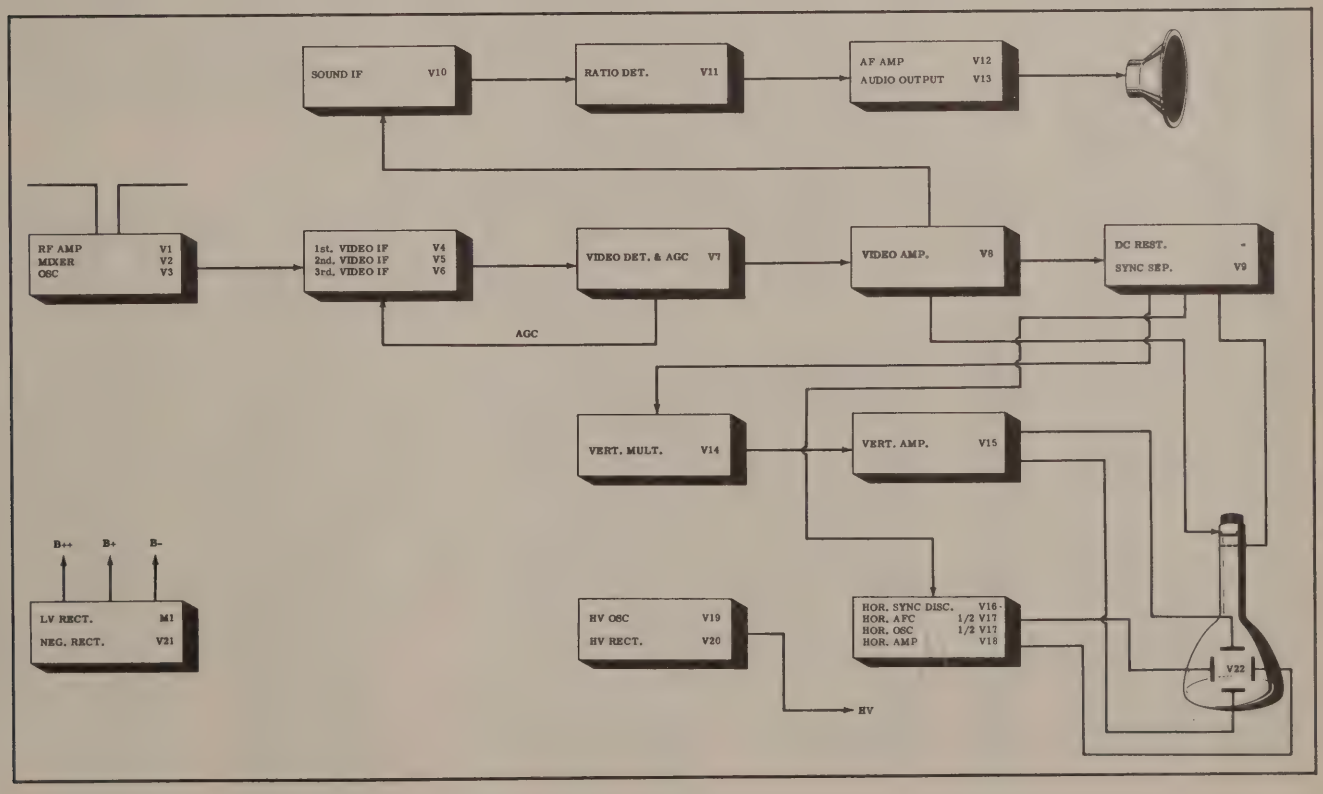
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



DIAL CORD DRIVE STRINGING



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	[illegible]	6J6	7BF	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	[illegible]	[illegible]	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det.-AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	DC Restorer-Sync. Sep.	6AU6	6AU6	7BK	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	AF Amp.	6AT6	6AT6	7BT	
V13	Audio Output	25L6GT	25L6GT	7AC	
V14	Vert. Mult.	12SN7GT	12SN7GT	8BD	
V15	Vert. Amp.	6SL7GT	6SL7GT	8BD	
V16	Hor. Sync. Disc.	6AL5	6AL5	6BT	
V17	Hor. AFC-Hor. Osc.	12SN7GT	12SN7GT	8BD	
V18	Hor. Amp.	12SN7GT	12SN7GT	8BD	
V19	HV Osc.	12SN7GT	12SN7GT	8BD	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	25Z6GT	25Z6GT	7Q	
V22	Picture Tube	7JP4	7JP4	14G	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	200	150	TCE100D	AF4025D	UP11BJ			▲ Filter
B	125	150			1055			▲ Filter
C2A	80	150	TCE128D	AF1616D	UP444315†		TVL-14	▲ Filter
B	80	150						▲ Filter
C3	80	150	TCR127D	AF30D	UP8015		TVL-1	Filter
C4	30	200	*					Filter
C5A	40	150	*	PRS150/40-40	EDL4415		TA-440	Filter - Red
B	40	150						Filter - Green
C6	30	200	TCE103D	PRS250/40	BR3035		UT-402	DC Res. Sync. Amp. Dec.
C7	4	25	TCE104D	PRS150/4	BR550		TVA-13	Stabilizing Cap.
C8	40	350		PRS350/40	BR4035		UT-40	Filter †
C9	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	RF Coupling
C10	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	RF Coupling
C11	360		TCC361-10			GP2K-390		RF Cathode Bypass
C12	360		TCC361-10			GP2K-390		RF Plate Decoupling
C13	1		TCC010-11					RF Coupling
C14	22		TCC22-12			GP1K-22		RF Coupling
C15	5000		TCC5025P			811-005	29C1	Mixer Decoupling
C16	1		TCC010-11					Osc. Coupling
C17	4.7		TCC4.7-11			N750K-5		Osc. Feedback
C18	4.7		TCC4.7-11			N750K-5		Osc. Feedback
C19	270	1000	TCM271-13	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C20	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	RF Bypass †
C21	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	AGC Filter
C22	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass
C23	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	1st V. IF Fil. Bypass
C24	270	1000	TCM271-13	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C25	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	AGC Filter
C26	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass
C27	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	2nd V. IF Fil. Bypass
C28	270	1000	TCM271-13	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C29	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass
C30	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	3rd V. IF Cath. Bypass
C31	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	3rd V. IF Fil. Bypass
C32	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass
C33	1500		TCC152-10	1467-0015	1W5D15	GP2L-0015	1FM-215	IF Coupling
C34	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	DAGC Decoupling
C35	.25	200	TCP254-1	P488-25	GT4P25		MS-55	AGC Filter
C36	5	300	TCC5-11	1468-000005	5W5V5	N90K-5	MS-55	V. Diode Filter
C37	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	V. Det.-AGC Fil. Bypass
C38	.05	400	TCP503-4	P488-05	GT4S5		TM-15	Video Coupling
C39	270	500	TCM271-13	1468-00025	5W5T25	GP2K-270	1FM-325	V. Amp. Cath. Bypass
C40	.25	400	TCP254-4	P488-25	GT4P25		TC-2	Video Coupling
C41	.05	400	TCP-503-4	P488-05	GT4S5		TM-15	Video Coupling
C42	2.2		TCC2.2-11					S. IF Coupling
C43	.02	400	TCP203-4	P488-02	GT4S2		TM-12	S. IF Cath. Bypass
C44	.02	600	TCP203-4	P688-02	GT6S2		TM-12	S. IF Decoupling
C45	330	500	TCM331-5	1468-00035	5W5T3	GP2K-330	1FM-335	Diode Load Cap.
C46	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass
C47	1500		TCC152-10	1467-0015	1W5D15	GP2L-0015	1FM-215	De-emphasis
C48	.02	400	TCP203-4	P488-02	GT4S2		TM-12	Audio Coupling
C49	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	Vol. Cont. Isolation
C50	.01	400	TCP103-10	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C51	.005	600	TCP502-10	P688-005	GT6D5	GP2M-005	TM-25	Audio Coupling
C52	.02	400	TCP203-4	P488-02	GT4S2		TM-12	Output Plate Bypass
C53	270	1000	TCM271-13	1468-00025	5W5T25	GP2K-270	1FM-325	Sync. Sep. Plate Bypass
C54	.005	600	TCP502-10	P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C55	.005	600	TCP502-10	P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C56	.01	600	TCP103-10	P688-01	GT6S1	GP2-335-01	TM-11	Vert. MV Feedback
C57	.1	400	TCP104-4	P488-1	GT4P1		TM-1	Vert. Discharge
C58	.1	400	TCP104-4	P488-1	GT4P1		TM-1	Vert. Sweep Coupling
C59	100	1000	TCM101-14	1468-0001	5W5T1	GP1K-100	1FM-31	Vert. Sweep Coupling
C60	5000	500	TCM502-8	1467-005	1D5D5	GP2M-005	1FM-25	Voltage Divider
C61	.005	6000	TCP502-6K	6089-005	DSTH60D5		TVM-256	Vert. Sweep Coupling
C62	.005	6000	TCP502-6K	6089-005	DSTH60D5		TVM-256	Vert. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C63	100	1000	TCM271-13	1468-0001	5W5T1	GP1K-100	1FM-31	Hor. Sync. Coupling
C64	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	AFC Filter
C65	.1	400	TCP104-4	P488-1	GT4P1		TM-1	AFC Feedback
C66	.1	400	TCP104-4	P488-1	GT4P1		TM-1	Decoupling
C67	500	500	TCM471-2	1469-0005	5R5T5		MS-35	Fixed Trimmer
C68	2000	500	TCP202-10	1467-002	1W5D2	GP2M-002	1FM-22	Hor. Osc. Grid Cap.
C69	.005	600	TCP502-10	P688-005	GT6D5	GP2M-005	TM-25	Hor. Discharge
C70	.002	600	TCP202-10	P688-002	GT6D2	GP2M-002	TM-22	Hor. Sweep Coupling
C71	.002	600	TCP202-10	P688-002	GT6D2	GP2M-002	TM-22	Hor. Sweep Coupling
C72	.005	6000	TCP502-6K	6089-005	DSTH60D5		TVM-256	Hor. Sweep Coupling
C73	.005	6000	TCP502-6K	6089-005	DSTH60D5		TVM-256	Hor. Sweep Coupling
C74	1500		TCC152-10	1467-0015	1W5D15	GP2L-0015	1FM-215	HV Osc. Grid Cap.
C75	360	500	TCM361-6	1469-00035				Fixed Trimmer
C76	750	500	TCM751-8	1464-00075				Fixed Trimmer
C77	.05	600	TCP503-10	P688-05	GT4S5		TM-15	Osc. Plate Decoupling
C78	.0005	6000	TCP501-6K	7584-0005	DSTH60T5		TVM-356	HV Filter
C79	.0005	6000	TCP501-6K	7584-0005	DSTH60T5		TVM-356	HV Filter
C80	.05	600	TCP503-10	P688-05	GT6S5		TM-15	RF Bypass †
C81	.05	600	TCP503-10	P688-05	GT6S5		TM-15	Line Filter
C82	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	Filament Bypass
C83	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	Filament Bypass
C84	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	Filament Bypass
C85	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	Filament Bypass †
C86	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass †
C87	5000		TCC502SP	1467-005	1D5D5	811-005	29C1	RF Bypass †
C88	.01	600	TCP103-10	P688-01	GT6S1	GP2-335-01	TM-11	Cent. Cont. Bypass
C89	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	Switch Bypass
C90	360		TCC361-10	1468-00035	5W5T4	GP2K-390	1FM-335	Switch Bypass

* Items C4, C5A and C5B are replaced by 100MFD 150 Volts in some models. Manufactures Part No. TCE107D
† Not used in all models.
‡ Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	TVC-100D	Q13-133	M-60-Z	Volume Control
B	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions
R2A	1 Meg.	½	TVC-118D	B11-137 *	TVC-118D	Vert. hold control, front
B	50KΩ	½		B11-123 *		Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	100KΩ	½	TVC-101D	B11-108 *	TVC-101D	Contrast control, front
B	25KΩ	½		B11-120 *		Brightness control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit"
R4A	250KΩ	½	TVC-116D	Q11-130	AM-55-S	Width control
B	Shaft		Not Req.	SQ	KSS-3 #	Attach to R4A per instructions
R5A	5 Meg.	½	TVC-103D	Q11-141	AM-85-S	Height control
B	Shaft		Not Req.	SQ	KSS-3 #	Attach to R5A per instructions
R6	2.5 Meg.	½	TVC-510D	Q11-239 †		Focus control
R7	5 Meg.	½	TVC-51ID			Horiz. centering control, tapped at 2.5 Meg.
R8	5 Meg.	½	TVC-51ID			Vert. centering control, tapped at 2.5 Meg.

* Additional parts to be used with "Concentrikit".
# File slot in shaft to duplicate original.
† Saw off shaft of new control and file slot in shaft to duplicate original. Use original insulated spacer bushing and shaft with new control.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R9	330Ω 10%	½	TRC-331-2		RF Cathode
R10	56Ω 10%	½	TRC-560-2		Parasitic Supp.
R11	1000Ω	½	TRC-102-1	BTS-1000	RF Decoupling
R12	4700Ω 5%	2	TRC-472-3	BTS-4700-5%	Mixer Grid Coil Shunt
R13	1 Meg.	½	TRC-105-1		Mixer Grid
R14	1000Ω	½	TRC-102-1	BTS-1000	Mixer Decoupling
R15	27KΩ	½	TRC-273-1		Osc. Grid
R16	27KΩ	½	TRC-273-1		Osc. Grid
R17	47Ω	½	TRC-470-1		Osc. Cathode
R18	11KΩ 5%	2	TRC-113-3		1st Video IF Grid
R19	82Ω 10%	½	TRC-820-2		1st Video IF Cathode
R20	150Ω	½	TRC-151-1		AGC Network
R21	10KΩ 5%	2	TRC-103-3		2nd Video IF Grid
R22	82Ω 10%	½	TRC-820-2		2nd Video IF Cathode
R23	150Ω	½	TRW-151-1	BW-½-150	Decoupling-Wire Wound
R24	150Ω	½	TRW-151-1	BW-½-150	Decoupling-Wire Wound-See Note 1
R25	11KΩ 5%	2	TRC-113-3		3rd Video IF Grid
R26	82Ω 10%	½	TRC-820-2		3rd Video IF Cathode
R27	150Ω	½	TRC-151-1		AGC Network
R28	2.2 Meg.	½	TRC-225-1	BTS-2.2 Meg.	AGC Network
R29	47KΩ	½	TRC-473-1	BTS-47K	AGC Rect. Diode Load
R30	2700Ω	½	TRC-272-1	BTS-2700	AGC Rect. Diode Load
R31	220KΩ	½	TRC-224-1	BTS-220K	Voltage Divider
R32	8200Ω 5%	2	TRC-822-3	BTS-8200-5%	Video Det. Diode Load
R33	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Video Amp. Grid
R34	6800Ω 5%	1	TRC-682-6	BTA-6800-5%	Video Amp. Plate
R35	10KΩ	½	TRC-103-1	BTS-10K	Isolation
R36	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Sync. Sep. Grid
R37	100KΩ	½	TRC-104-1	BTS-100K	Picture Tube Grid
R38	100KΩ	½	TRC-104-1	BTS-100K	Sync. Sep. Plate Load
R39	100KΩ	½	TRC-104-1	BTS-100K	Voltage Divider
R40	560Ω	½	TRC-561-1	BTS-560	Voltage Divider
R41	100KΩ	½	TRC-104-1	BTS-100K	Voltage Divider
R42	82Ω 10%	½	TRC-820-2		Sound IF Cathode

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R43	220Ω	½	TRC-221-1		Parasitic Supp.
R44	470Ω	½	TRC-471-1	BTS-470	Sound IF Decoupling
R45	220Ω	½	TRC-221-1		Balancing
R46	220Ω	½	TRC-221-1		Balancing
R47	15KΩ 5%	½	TRC-153-3	BTS-15K-5%	Ratio Det. Diode Load
R48	15KΩ 5%	½	TRC-153-3	BTS-15K-5%	Ratio Det. Diode Load
R49	47KΩ	½	TRC-473-1	BTS-47K	De-emphasis
R50	10 Meg.	½	TRC-106-1	BTS-10 Meg.	AF Grid
R51	390KΩ	½	TRC-394-1	BTS-390K	AF Plate
R52	6.8 Meg.	½	TRC-685-1	BTS-6.8 Meg.	Bias Network
R53	470KΩ	½	TRC-474-1	BTS-470K	Output Grid
R54	4700Ω	½	TRC-472-1	BTS-4700	Integrator
R55	4700Ω	½	TRC-472-1	BTS-4700	Integrator
R56	1000Ω	½	TRC-102-1	BTS-1000	Vert. Osc. Cathode
R57	100KΩ 5%	½	TRC-104-4	BTA-100K-5%	Vert. Osc. Plate
R58	390KΩ	½	TRC-394-1	BTS-390K	Vert. Osc. Grid
R59	390KΩ	½	TRC-394-1	BTS-390K	Vert. Osc. Plate
R60	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Vert. Amp. Grid
R61	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Vert. Amp. Grid
R62	4.7 Meg. 10%	1	TRC-475-5	BTA-4.7 Meg.	Vert. Amp. Plate
R63	4.7 Meg. 10%	1	TRC-475-5	BTA-4.7 Meg.	Vert. Amp. Plate
R64	15 Meg.	½	TRC-156-1	BTS-15 Meg.	Voltage Divider
R65	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Voltage Divider
R66	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Voltage Divider
R67	5.6 Meg.	½	TRC-565-1	BTS-5.6 Meg.	Vert. Deflection Load
R68	5.6 Meg.	½	TRC-565-1	BTS-5.6 Meg.	Vert. Deflection Load
R69	100KΩ	½	TRC-104-1	BTS-100K	Horiz. Sync. Disc. Load
R70	100KΩ	½	TRC-104-1	BTS-100K	Horiz. Sync. Disc. Load
R71	51KΩ 5%	½	TRC-513-3		Horiz. AFC Filter Network-See Note 2
R72	150Ω 5%	2	TRC-152-3	BTS-1500-5%	Horiz. AFC Cathode
R73	51KΩ 5%	½	TRC-513-3		Horiz. AFC Plate
R74	51KΩ 5%	½	TRC-513-3		Decoupling
R75	47KΩ 10%	½	TRC-473-2	BTS-47K	Horiz. Osc. Grid
R76	18KΩ 10%	½	TRC-184-2	BTS-180K	Horiz. Amp. Plate
R77	220KΩ	½	TRC-224-1	BTS-220K	Horiz. Amp. Grid
R78	220KΩ	½	TRC-224-1	BTS-220K	Horiz. Amp. Grid
R79	220KΩ	½	TRC-224-1	BTS-220K	Feedback
R80	4.7 Meg.	½	TRC-475-1	BTS-4.7 Meg.	Horiz. Deflection Load
R81	4.7 Meg.	½	TRC-475-1	BTS-4.7 Meg.	Horiz. Deflection Load
R82	7500Ω 5%	½			HV Osc. Grid
R83	68Ω	½			Parasitic Supp.
R84	100Ω	½			Parasitic Supp.
R85	68Ω	½			Parasitic Supp.
R86	100KΩ	1			HV Filter
R87	150Ω	1	TRW-151-4	BW-1-150	Filter-Wire Wound
R88	150Ω	1	TRW-151-4	BW-1-150	Bias Network-Wire Wound
R89	650Ω	5			Bias Filter-Wire Wound-See Note 3
R90	86Ω	2	TRW-860-8		Filament Shunt-Wire Wound
R91	1 Meg.	½	TRC-105-1		Voltage Divider
R92	3.3 Meg.	½	TRC-335-1		Voltage Divider
R93	2.2 Meg. 10%	1	TRC-225-5		Voltage Divider
R94	2.2 Meg. 10%	1	TRC-225-5		Voltage Divider
R95	2.2 Meg. 10%	1	TRC-225-5		Voltage Divider
R96	2.2 Meg. 10%	1	TRC-225-5		Voltage Divider

Note 1. Not used in all models.
Note 2. Some models use 27KΩ resistor in this application.
Note 3. Some models use 680Ω, 2 watt resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.3Ω	TSP46B	ST-113 ① MOD. P4-X	4A1 ①	①Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T1	7.5Ω	3.3Ω	TTR168-D	A-8110	A-3002		Hor. Block Osc. Trans.
T2	1100Ω Tap at 350Ω, 550Ω and 750Ω	2.9Ω CT	TTR166-D				Hor. Deflection Trans.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T3	1.1Ω	750Ω	25Ω	0Ω	TLF-137-D			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T4	2.6KΩ	3.3Ω	250Ω	.6Ω	Part of TSP46B	A-3876 ①	A-2928 ①	RO-2 ①	①Bend mounting tabs down and mount on original bracket.

COILS (RF-IF)

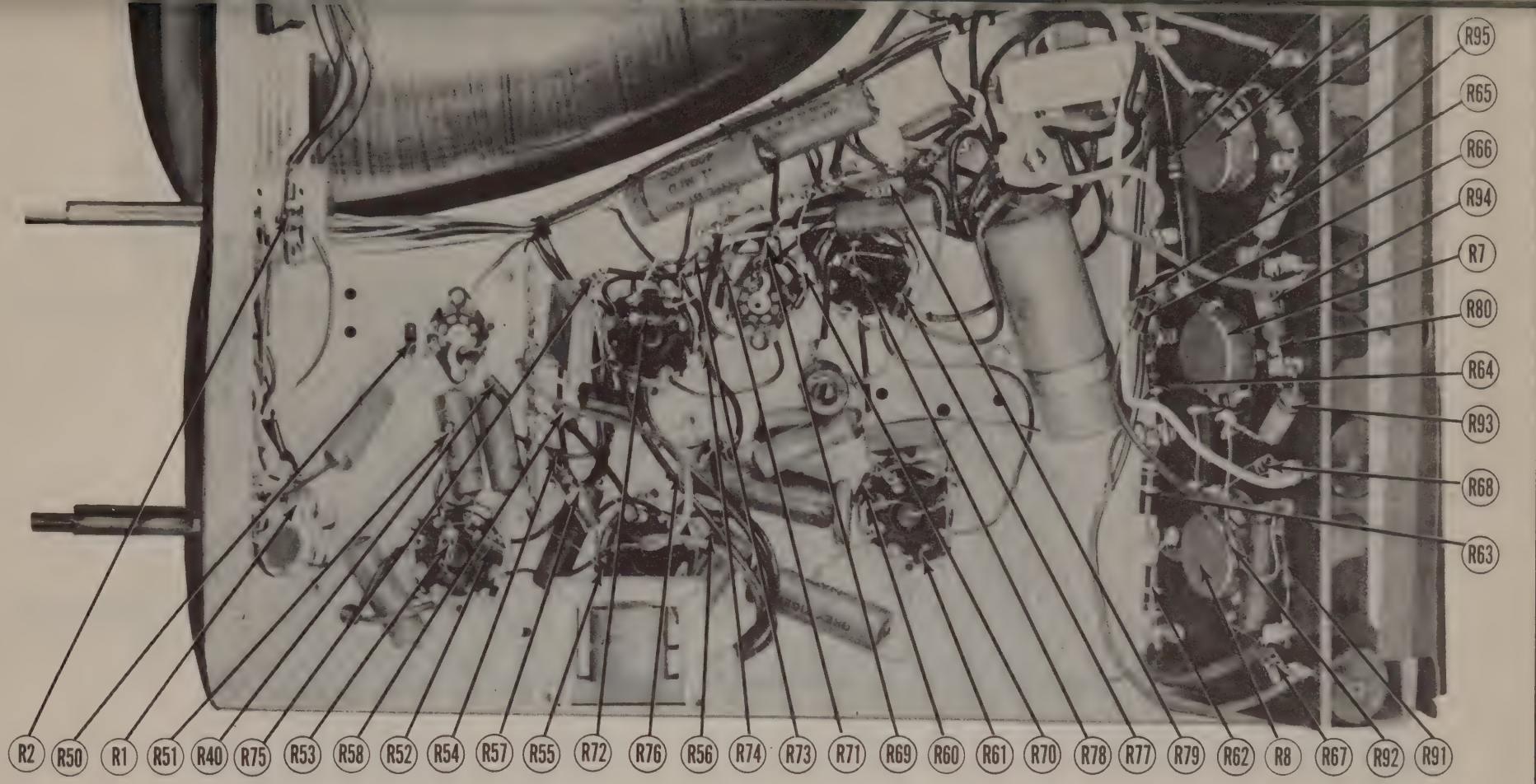
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	
L1	Ant. Input	.2Ω				Part of tuner.
L2	RF End. Inductor	0Ω		TLF143-D		
L3	RF End Inductor	0Ω		TLF143-D		
L4	RF Plate Chk.	0Ω				Part of tuner.
L5A	Osc. Coil	0Ω		TLF120-1D		Channel #2
B	Osc. Coil	0Ω		TLF120-2D		Channel #3
C	Osc. Coil	0Ω		TLF120-3D		Channel #4
D	Osc. Coil	0Ω		TLF120-4D		Channel #5
E	Osc. Coil	0Ω		TLF120-5D		Channel #6
F	Osc. Coil	0Ω		TLF120-6D		Channel #7
G	Osc. Coil	0Ω		TLF120-7D		Channel #8
H	Osc. Coil	0Ω		TLF120-8D		Channel #9
I	Osc. Coil	0Ω		TLF120-9D		Channel #10
J	Osc. Coil	0Ω		TLF120-10D		Channel #11
K	Osc. Coil	0Ω		TLF120-10D		Channel #12
L	Osc. Coil	0Ω		TLF120-10D		Channel #13
L6	1st Video IF	.1Ω		TLF147-D		
L7	2nd Video IF	.1Ω		TLF147-D		
L8	3rd Video IF	.1Ω		TLF147-D		
L9	4th Video IF	.1Ω	.1Ω			
L10	Peaking	6Ω		TLF133-D		Wound on 33KΩ resistor.
L11	Peaking	12Ω		TLF134-D		
L12	Peaking	6.5Ω		TLF135-D		Wound on 22KΩ resistor.
L13	Peaking	10.5Ω		TLF136-D		Wound on 15KΩ resistor.
L14	Sound IF	1.5Ω		TLF114-D		
L15	Ratio Det. Trans.	4Ω	.8Ω	TLF142-D		
L16	Fil. Choke	.1Ω		TLF144-D		
L17	Fil. Choke	.1Ω		TLF144-D		
L18	Cath. Choke	34Ω		TLF506-1D		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	FIRESTONE PART No.	SYLVANIA PART No.		
M1	.160A	TSR100	NE-5		

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M2	RF Tuner		
M3	Ballast Tube	TBR102D	
	Safety Glass	TGL100D	
	Mask	TBF150D	Picture Tube
	Terminal Strip	TTS400D	Antenna
	Knob	TKN100D	Outside
	Knob	TKN101D	Inside, Small Shaft
	Knob	TKN103D	Inside, Large Shaft
	Knob	TKN108D	Inside, Small Shaft-with Dot



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

C23
C21
C22
C24
C25
C27
C35
C26
C28
C46
C31
C30
C7
C29
C32
C4
C38
C33
C37
C36
C87
C39
C53
C34
C41
C43
C6
C42
C45
C44
C40

MILWAUKEE 11200 SERIES
RECORD CHANGER

TOP VIEW

MILWAUKEE 11200 SERIES
RECORD CHANGER

GENERAL INFORMATION

The Model 11200 automatic record changer is a precision-built, gearless and beltless mechanism, designed to play automatically twelve 10-inch records or ten 12-inch records, not intermixed. The last record will be repeated until the changer is turned off. This changer is a single knob controlled mechanism, providing Off, Manual, Automatic, and Reject operations. Any record may be rejected while playing by turning the control knob to Reject momentarily. Manual operation is provided for single records, home recordings, or odd-size records.

This changer is designed to operate on 117-volt, 60-cycle alternating current unless otherwise specified on motor.

Manufactured by

MILWAUKEE STAMPING COMPANY

Milwaukee 14, Wisconsin

THIS MATERIAL COMPILED AND PUBLISHED BY

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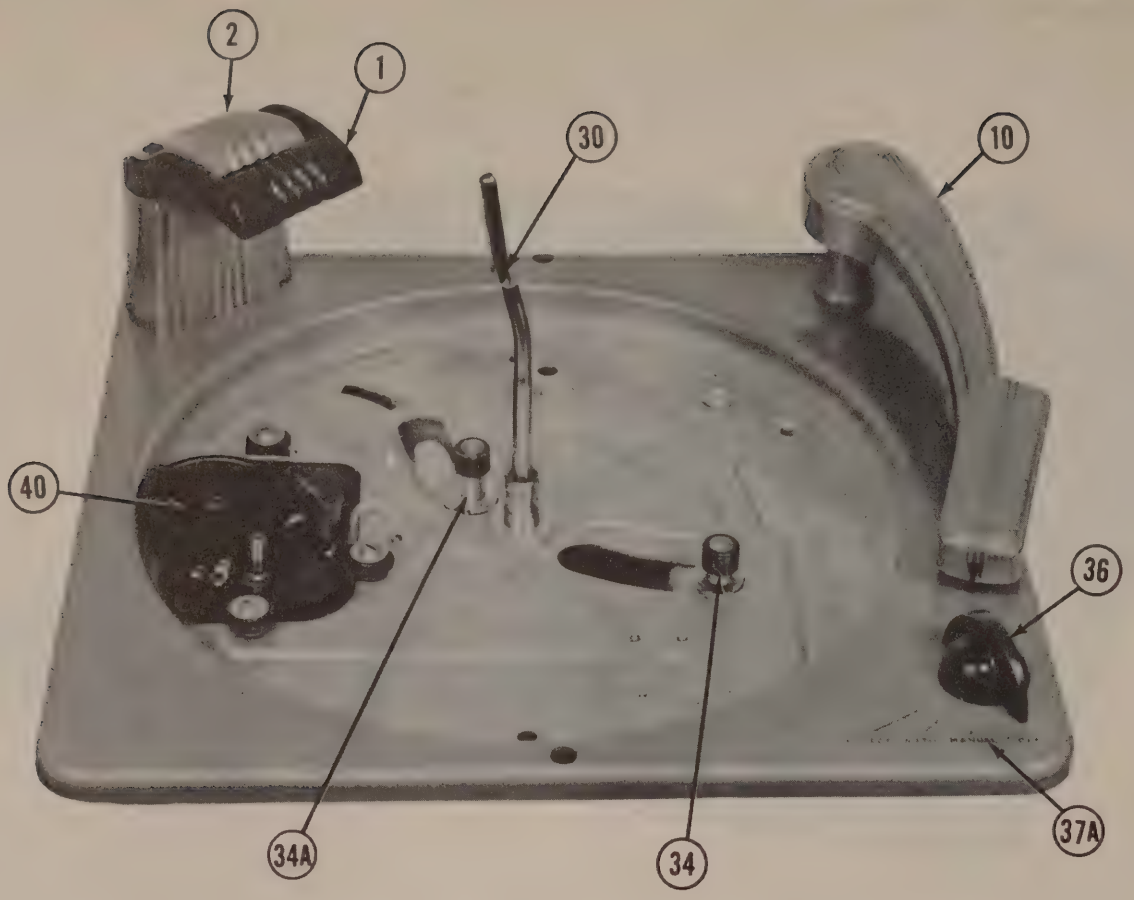


TOP VIEW—TURNTABLE REMOVED

AUTOMATIC OPERATION

1. Be sure the pickup arm (10) is on the pickup arm rest (35).

2. Raise the balance arm (1) to a vertical position.

3. For 10-inch records, lower the hinged 10-inch record support (2) to its rest position on the ejector box (8). For 12-inch records, raise the 10-inch record support to a vertical position.

4. Place a stack of records, not to exceed twelve 10-inch records or ten 12-inch records, not intermixed, over the center post. The records will now rest on the step on the center post and on either the ears of the ejector box on the ledge of the 10-inch record support, depending on the size of records being used and position of 10" record support.

5. Lower the balance arm (1) to the records; this steadies the records and assures correct dropping of records.

6. Turn the control button (36) momentarily to the "Reject" position and release it. This turns the changer on and starts the change cycle, thus dropping the first record to the turntable.

7. To reject a record being played, turn the control knob to "Reject" and release it.

8. To discontinue operation, all records should be dropped to the turntable by repeatedly turning the control button to the Reject position until all unplayed records have dropped to the turntable. Place the pickup arm on the pickup arm rest and turn the control button to the "Off" position.

9. To remove the records from the turntable:
   (a) Raise the balance Arm (1) and the 10-inch record support upward, if the record support is in a horizontal position, to permit easy removal of records.
   (b) Lift the records from the turntable.

MANUAL OPERATION

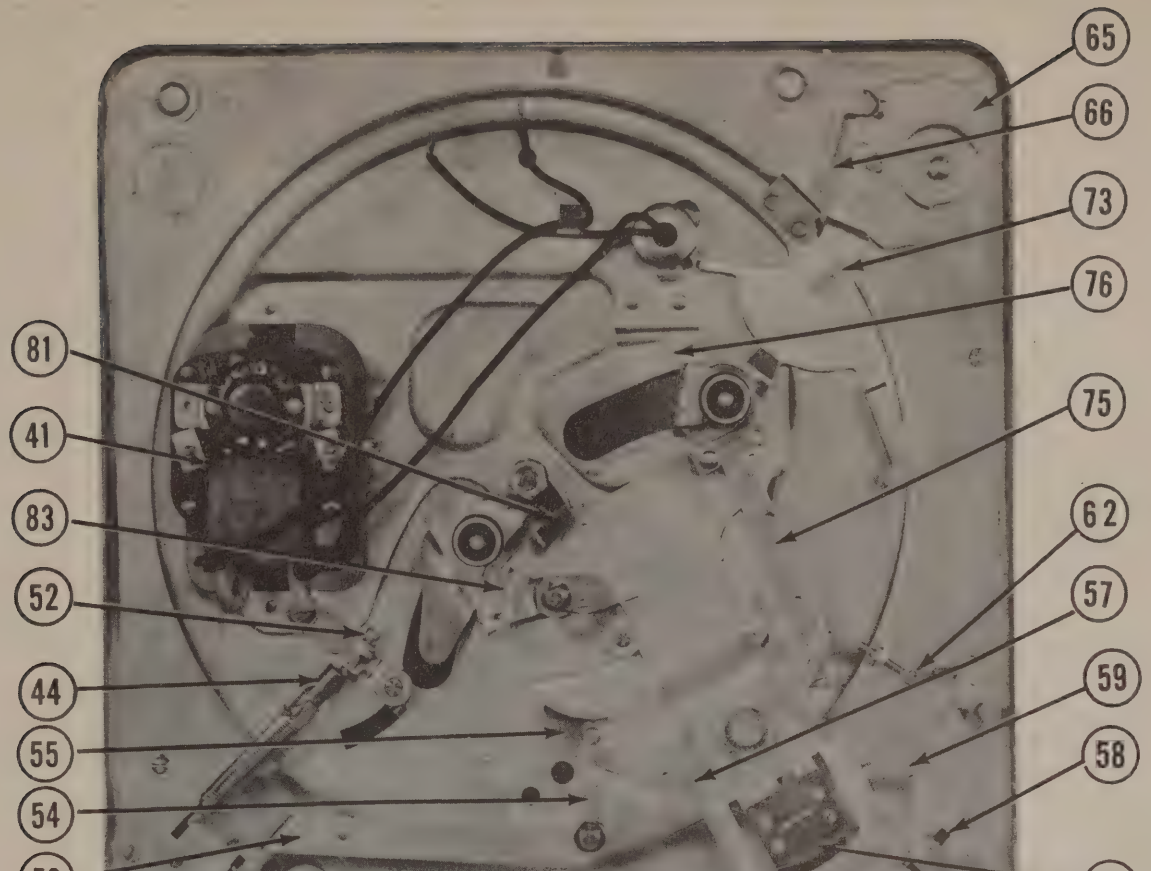
1. Raise the balance arm (1) and the hinged 10-inch record support (2) to a vertical position.

2. Place a record on the turntable.

3. Turn the control button to the "Manual" position. This action starts the rotation of the turntable. The position of the selector lever (73) blocks the movement of the lead bearing pin (34), thus preventing the changer from cycling.

4. Place the pickup arm on the lead-in groove at the edge of the record.

5. When the record has finished playing, return the



BOTTOM VIEW

pickup arm to the arm rest and turn the control button to the "Off" position.

THE CHANGE CYCLE

The change cycle may be started by turning the control button (36) to "Reject." The selector lever (73) then, being pivoted through the action of the notched washer, moves against the lead roller dropping lever (75), causing the flange of the dropping lever to be pivoted away from the top of the lead roller shoulder nut. This allows the lead roller bearing pin (34) to rise through the action of the compression spring (74) and to enter the spiral of the turntable, thus starting the change cycle.

As the lead roller of the swing arm follows the spiral on the underside of the turntable, the swing arm (64) cam engages the plunger pin (13), thus raising the pickup arm.

The ratchet arm friction spring (61) engages the ratchet arm (57), swinging the pickup arm out to a position where it is stopped by the ratchet arm contacting the stop bracket (91). The swing arm now pushes against the cam roller of the ejector idler lever (49), which, in turn, moves the lower push pin (44), the ejector lever (27), and the 12-inch record slide bolt (9), thus pushing a 12-inch record off the record shelf.

When 10-inch records are being played, the 12-inch record slide moves forward pushing the 10-inch record slide bolt (3), thus dropping a 10-inch to the turntable.

As the swing arm nears the end of its swing, the cammed dropping lever (83) comes in contact with the lever trip bracket (55), allowing the return roller pin (34C) to rise and enter the spiral groove.

The lead roller pin assembly is pushed back out of the spiral groove of the turntable by the cam surface at the center of the spiral and is held in position by the flange of the lead roller dropping lever (75). The swing arm is now moved back as the return roller follows the spiral.

The ejector assembly is now returned to its original position.

The pickup arm is moved back toward the record for set down by the friction springs (61). The pickup arm is stopped in proper position by the engagement of the ratchet arm (59) and the ratchet arm lever (57). The position of the ratchet arm lever is determined by the change lever (53) and the change lever ejector (29), which are operated by the 10-inch record support (2).

A PHOTOFACT "EXPLODED" VIEW

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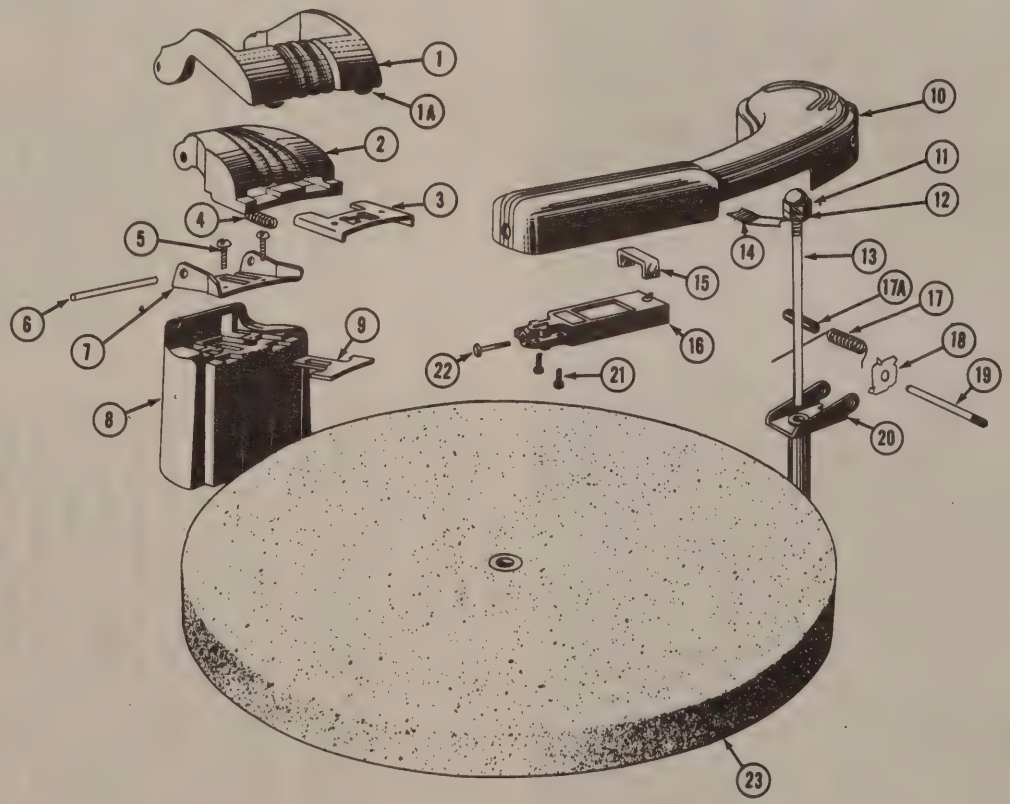

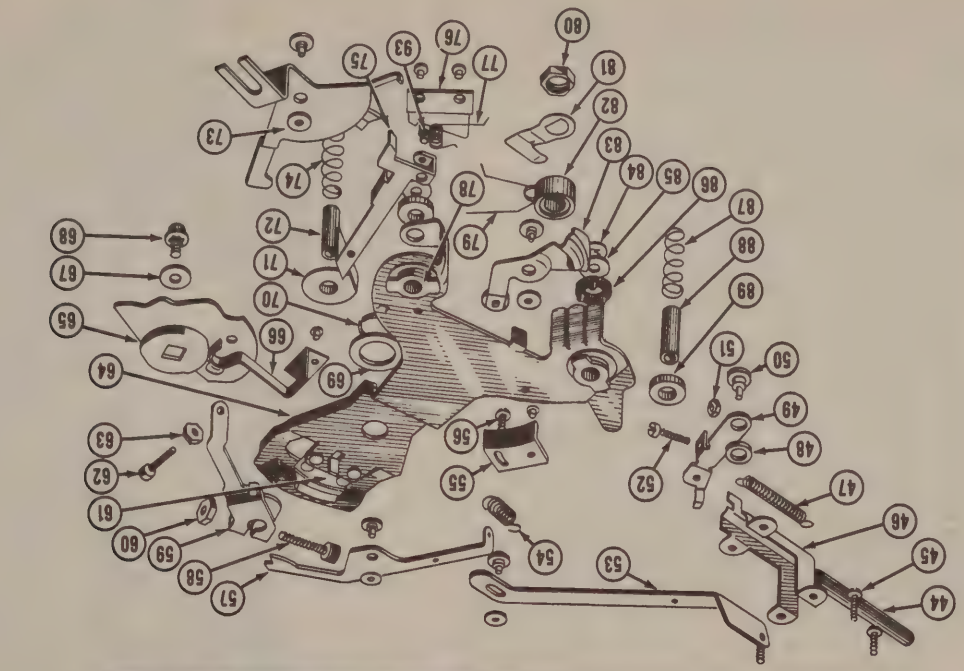
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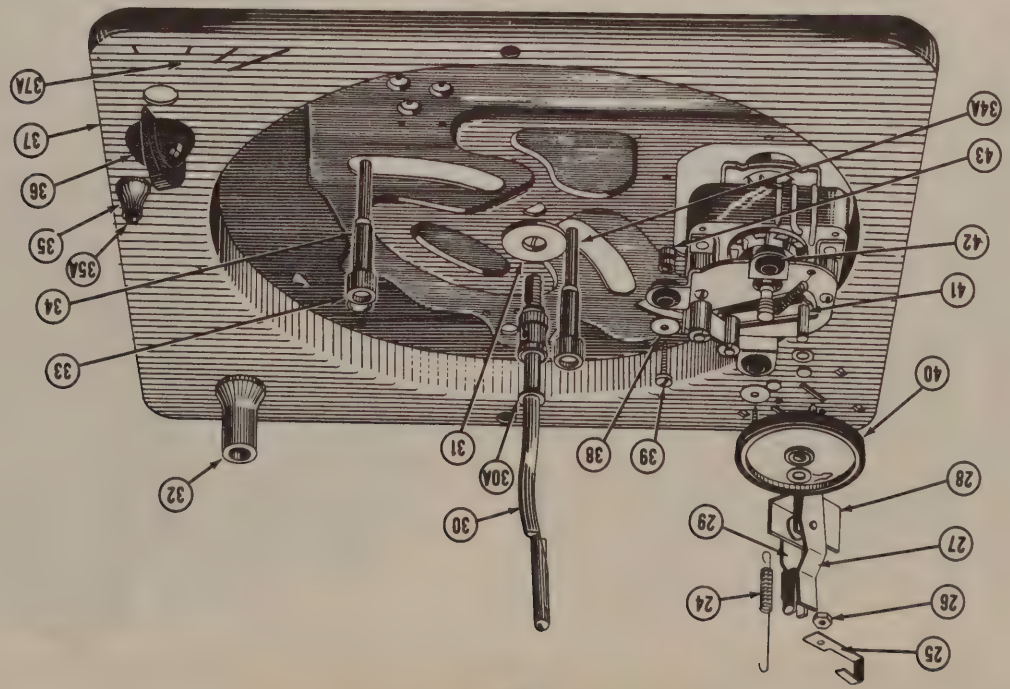
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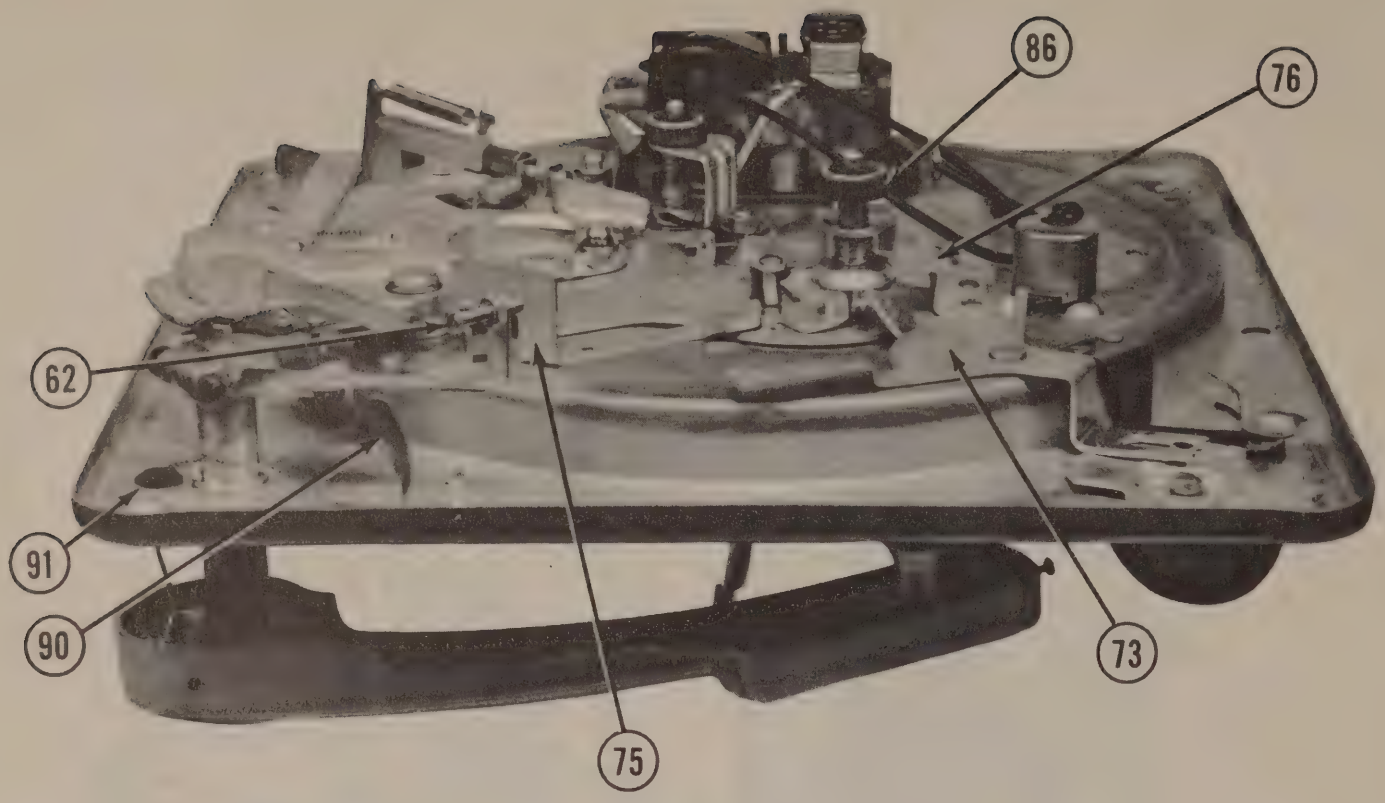


SIDE VIEW

As the cycle nears completion, the swing arm contacts the brake spring (81) which prevents acceleration of the swing arm, thus assuring gentle lowering of the pickup arm to the record as the plunger pin rides down the cam of the swing arm. The friction springs (61) and the ratchet arm lever (57) are moved away from the ratchet arm through the movement of the swing arm; therefore, the pickup arm is free to move across the record.

The return roller pin assembly is pushed back out of the spiral groove of the turntable by the cam surface at the center of the spiral, and is held in position by the cammed dropping lever (83). This completes the change cycle.

Positive tripping action takes place when the needle moves to within 1⅞" of the center of the spindle. The adjusting screw (62) of the ratchet arm strikes the dropping lever (75) and moves it, thus starting a new change cycle.

SERVICE PROCEDURES

Records Fail to Drop

1. Trip the changer and rotate the turntable by hand until the swing arm (64) completes the first half of the cycle:

(a) Adjust screw (52) until the 12-inch record slide bolt (9) extends 1/32" past the ears of the ejector box.

(b) If 12-inch records fail to drop to turntable, check the ejector arm extension spring (47) to see if it is loose or missing. If loose, or missing, the 12-inch record slide bolt (9) and the ejector lever (27) will stay in a forward position; thereby the ejector mechanism will not be actuated and the records will not be dropped to the turntable.

(c) If 10-inch records fail to drop to the turntable, check the 10-inch record support (2) to see if it is completely resting on the ears of the ejector box. Check to see if the ejector compression spring (4) is missing. If this spring is missing, the 10-inch record slide bolt (3) will stay in a forward position.

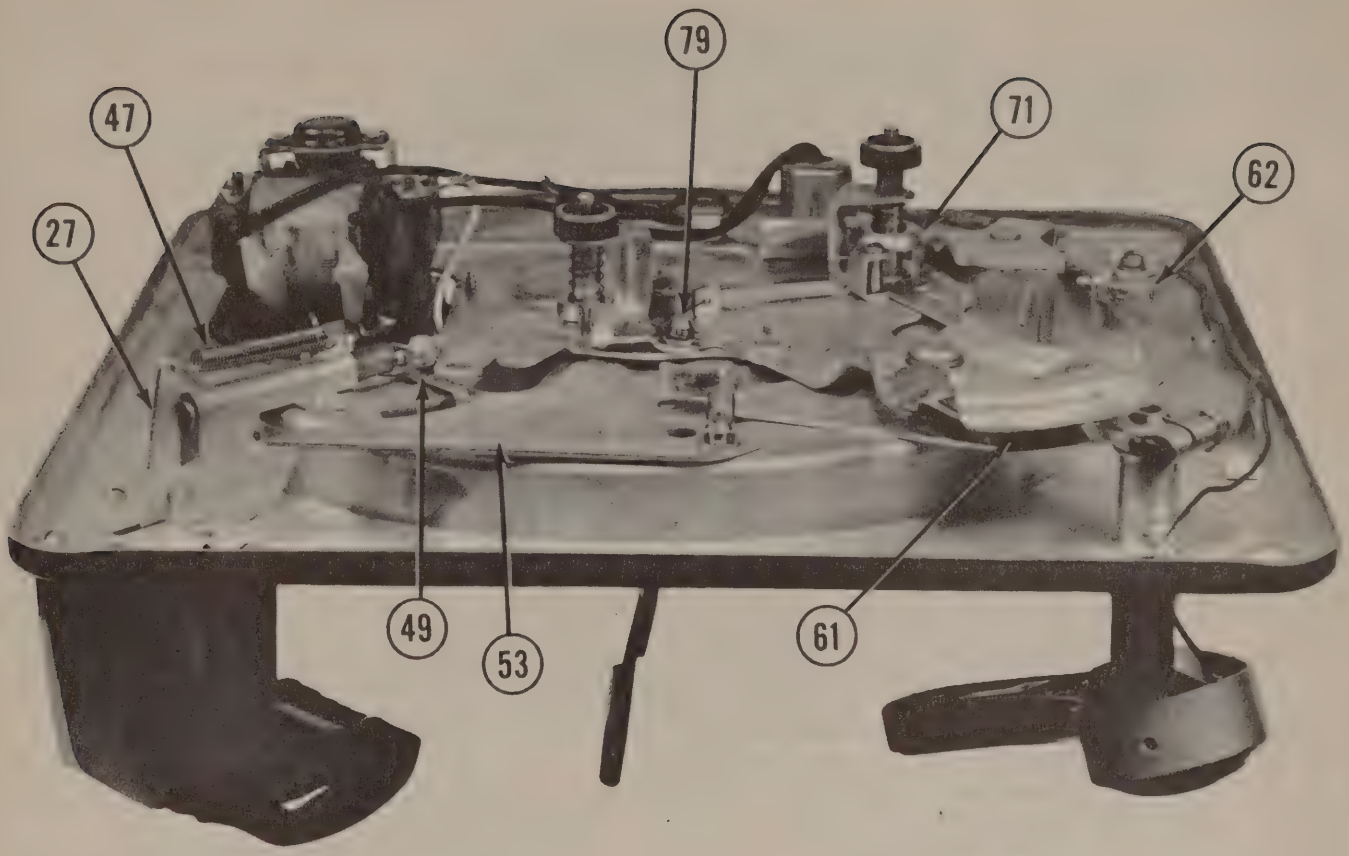
Pickup Arm Does Not Set Down in Correct Position

1. With the control knob turned to "Off" position, trip mechanism and rotate the turntable by hand through the cycle; note where the needle lands. Correction may be made by loosening the clamp screw (57) and moving the pickup arm slightly with respect to the ratchet arm (59). The needle should land approximately ⅛" from the edge of the record.

2. Check spring (54) to see if it is missing or too weak to actuate ratchet arm lever (57).

Pickup Arm Drops Fast When Setting Needle on Record

1. Check the friction brake spring (81); may be weak or broken.



REAR VIEW

Pickup Arm Does Not Set Down on Record

1. The pickup arm height adjustment is made by the acorn nut (11) of the plunger pin (13).
2. Check the pickup lead wire to see if it is clear of the contact point of the pickup arm and the plunger pin.

Mechanism Trips Before Record Is Completed

1. Turn the adjusting screw (62) of the ratchet arm (59) counterclockwise. This adjustment will allow the pickup arm to travel nearer the spindle.

Mechanism Fails to Trip at End of Record

1. Check adjusting screw (62) to see if it is making contact with the lead roller dropping lever (75). This screw should be adjusted so that when the pickup arm comes within 1⅞" of the center of the record the mechanism will be tripped.

2. Check the compression spring (74). It may be too weak to actuate the lead roller bearing pin assembly, and may not raise it sufficiently to enter the spiral of the turntable. If this is true, the mechanism will not operate when the control button is turned to Reject.
3. If pickup arm jumps groove in record before tripping, check for tightening of drop lever (75) on washer (71).

Mechanism Jams in Second Half of Change Cycle

1. Check dropping lever torsion spring (77) to see if it is loose or missing. If this spring is not connected, the dropping lever will not be actuated, thus not holding the roller pin (34) down when it is pushed down by the cam surface at the center of the spiral of the turntable. This allows both rollers in the spiral at the same time, thereby jamming the mechanism.

Clicking of Mechanism and Jamming at the Start of the Change Cycle

1. Check the cammed dropping lever torsion spring (79) to see if it is loose or broken. This will allow both bearing pins to stay in a raised position.

Continuous Cycling

1. Check the selector lever spring (66) to see if it is broken or bent.

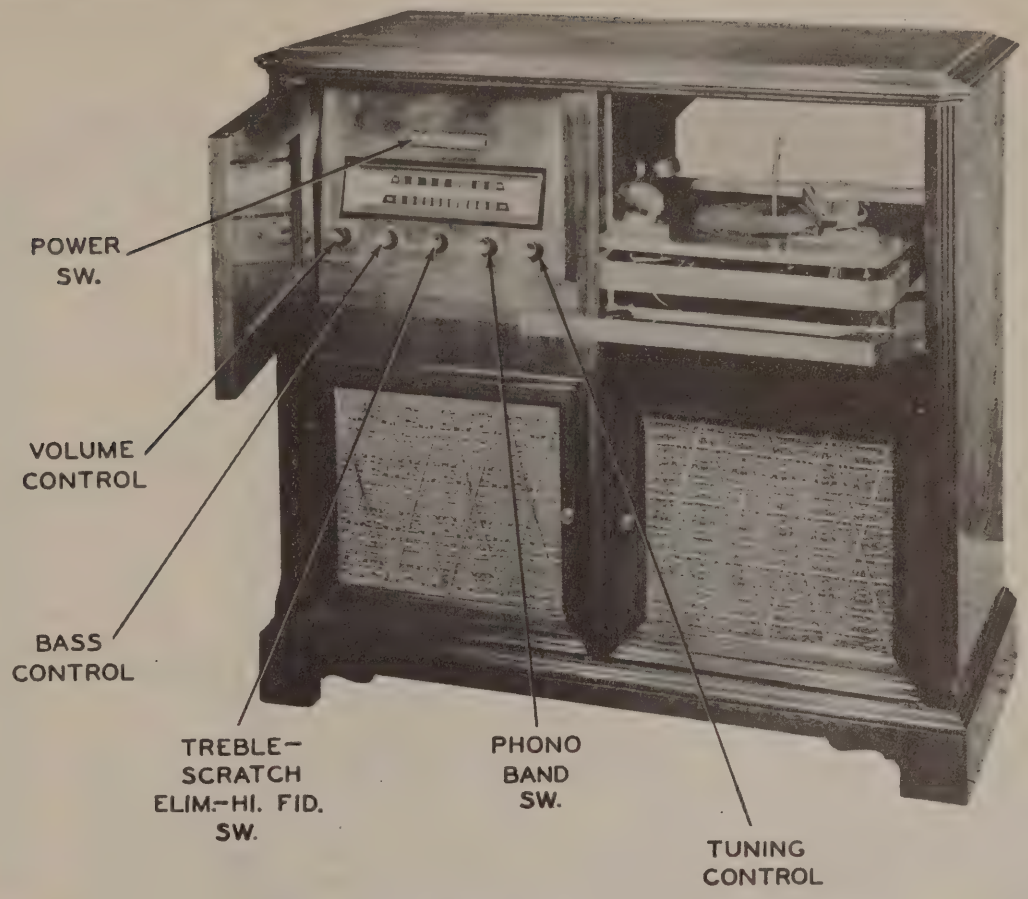
Changer Does Not Complete Change Cycle but Turntable Continues to Rotate

1. Check the compression spring (87). If spring is too weak to raise the bearing pin (34C), the swing arm will not return to its proper position, thus leaving the pickup arm in an outward and raised position.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	11212-A	Balance arm assembly including (1A)
1A	11211	Rubber bumpers (part of 1)
2	11213	10" record support
3	11214	10" record slide bolt
4	11215	Ejector compression spring
5	11232	4-40 x 3/8" R.H. machine screw
6	11223	Hinge pin
7	11209	Slide bolt cover
8	11208	Ejector box
9	11217	12" record slide bolt
10	10752	Pickup arm
11	10762	Acorn nut for pickup arm
12	10810	10-32 bearing pin jam nut
13	10757	Adjusting plunger pin
14	10754	Spring clip
15	10846	Viscoloy strip for cartridge
16	10753	Pickup cartridge
17	10764	Spring for pickup arm balance
17A	10763	Balance spring tube
18	10766	Ratchet for pickup arm
19	10798	Pin for pivot yoke
20	10755-CA	Pickup arm swing post sub-assembly
21	10834	4-40 x 1/4" fastening screw for cartridge
22		Needle screw supplied with cartridge
23	11202-A	Turntable sub-assembly
24	11210	Balance arm spring
25	11220	Ejector pressure spring
26	11241	4-40 hex nut
27	11218	Ejector lever (part of 28)
28	11219-A	Ejector pivot channel sub-assembly including (27) and (29)
29	11222	Change lever, ejector (part of 28)
30	11250-A	Center-post assembly
30A	10823-C	Friction spring washer
31	10828	Reenforcement washer
32	11230	Pickup arm mounting post (part of 37)
33	11248	Roller (part of 34 and 34A)
34	10743	Bearing pin (lead roller) assembly including (33)
34A	10743	Bearing pin (return roller) assembly including (33)
35	11245	Pickup arm rest (part of 37)
35A	11224	Arm rest bumper (part of 37)
36	11203	Control button
37	11201A	Mechanism plate sub-assembly, including (32, 35, 46, 91)
37A	11247	Decal
38		Flat washer
39	10827	6 x 5/8 SM motor mounting screw
40		Idler wheel (part of 41)
41	11227A	Motor and switch assembly
	10825	Phonomotor
	11243	Switch
42		Motor mounting grommet
43		Motor mounting spacers
44	10804	Lower push pin
45	10831	6-32 x 3/8 thd. cutting machine screw
46	10724	Ejector pin guide (part of 37)
47	10728	Ejector arm extension spring
48	10782	Lever bearing washer
49	10813-A	Ejector idler lever sub-assembly, Including (51 and 52)
50	10781	Lever fulcrum pin
51		Lock nut (part of 52)
52	10792	6-32 x 5/8" adjusting screw and nut including (51)
53	11236	Change lever
	10805	Slide washer
	10787	Lever fulcrum pin
54	11235	Ratchet arm lever spring
55	10811	Lever trip bracket 2 1/2/16" No. 2436 tubular rivet
56	10831	6-32 x 3/8" thd. cutting machine screw
57	11234	Ratchet arm lever
	10773	Change lever fulcrum pin
58	10837	1" x 10-32 socket head cap screw
59	11237	Ratchet arm
	11237A	Ratchet arm sub-assembly, including (58, 59, 60, 62, 63)
60	10810	10-32 hex nut
61	10735	Ratchet arm friction spring
	10791	Ratchet arm friction spring
62	10792	5/8" x 6-32 fillister hd. machine screw and hex nut, including (63)
63		Hex nut (part of 62)
64	11229	Swing arm
	11229-A	Swing arm sub-assembly including (ref. Nos. 33, 34, 71, 72, 74, 75, 78, 79, 83, 84, 85, 86, 87, 88, and 89)
65	11225	Notched washer
66	11226	Selector lever spring 2/16" 2436 tubular rivet
67	10801	Fulcrum bearing washer
68	10848	10-32 x 3/8" sems screw
69	11239	33/64" I.D. x 7/8" O.D. x .060" flat washer
70	11240	XSC retaining ring
71	11242	Lead roller shoulder nut
72	10751	Bearing pin spacer
73	11205	Selector lever
74	10750	Compression spring
75	11231	Lead roller drop lever
76	11228	Lead roller release 2 1/2/16" 2436 tubular rivet
77	11233	Drop lever torsion spring
78	10745	Swing arm clamp
79	10733	Cammed dropping lever torsion spring
80	10830-A	5/16"-24 center stud jam nut
81	10741	Friction brake spring
82	10736	Spacer collar for center post
83	10730-A	Cammed dropping lever assembly
	10787	Kickoff lever fulcrum pin
84	10765	Roller bearing speed nut
85	10801	Fulcrum bearing washer
86	11244	Roller cushion
87	10750	Compression spring
88	10751	Bearing pin spacer
89	10742	Bearing pin shoulder nut
90	10843	Ratchet arm stop bracket (part of 37)
91	10850	Grommet for pickup leads
92	10845	Mounting springs
93	11206	Dropping lever pivot pin

PHILCO
MODEL 50-1727



PHILCO
MODEL 50-1727

PHILCO MODEL 50-1727

TRADE NAME	Philco, Model 50-1727		
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.		
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES(ELEVEN)	Types 6AU6 FM RF Amp., 7F8 Converter, 6BJ6 1st IF Amp., 6BJ6 2nd IF Amp., 6T8 DET-AVC-AF, 7A4 Phase Inverter, (2) 6V6GT Power Output, 7F7 Phono Scratch Amp., 7E7 Phono Reactance Control, 5U4G Rectifier		
POWER SUPPLY	105-125 Volts AC	RATING	1.15 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	FREQ. MOD.	88-108MC

PUSHBUTTON ADJUSTMENTS

1. Turn the set on and allow 15 minutes warm up.
2. Turn the band switch to "pushbutton" (maximum counter-clockwise).
3. Determine the lowest frequency station desired on the pushbuttons.
4. Connect an output meter across the speaker voice coil. Set the AM signal generator to the frequency of the selected station, and connect the output to a radiation loop.
5. Depress the first pushbutton on the left, and adjust the oscillator slug (B1) for maximum output. Then adjust the antenna trimmer (B2) for maximum output.
6. Turn the signal generator off and make a final retouch adjustment of B1 and B2 while listening to the selected station.
7. Repeat the above procedure for each pushbutton, using the proper frequency for each station, starting with the lowest frequency station and working towards the highest.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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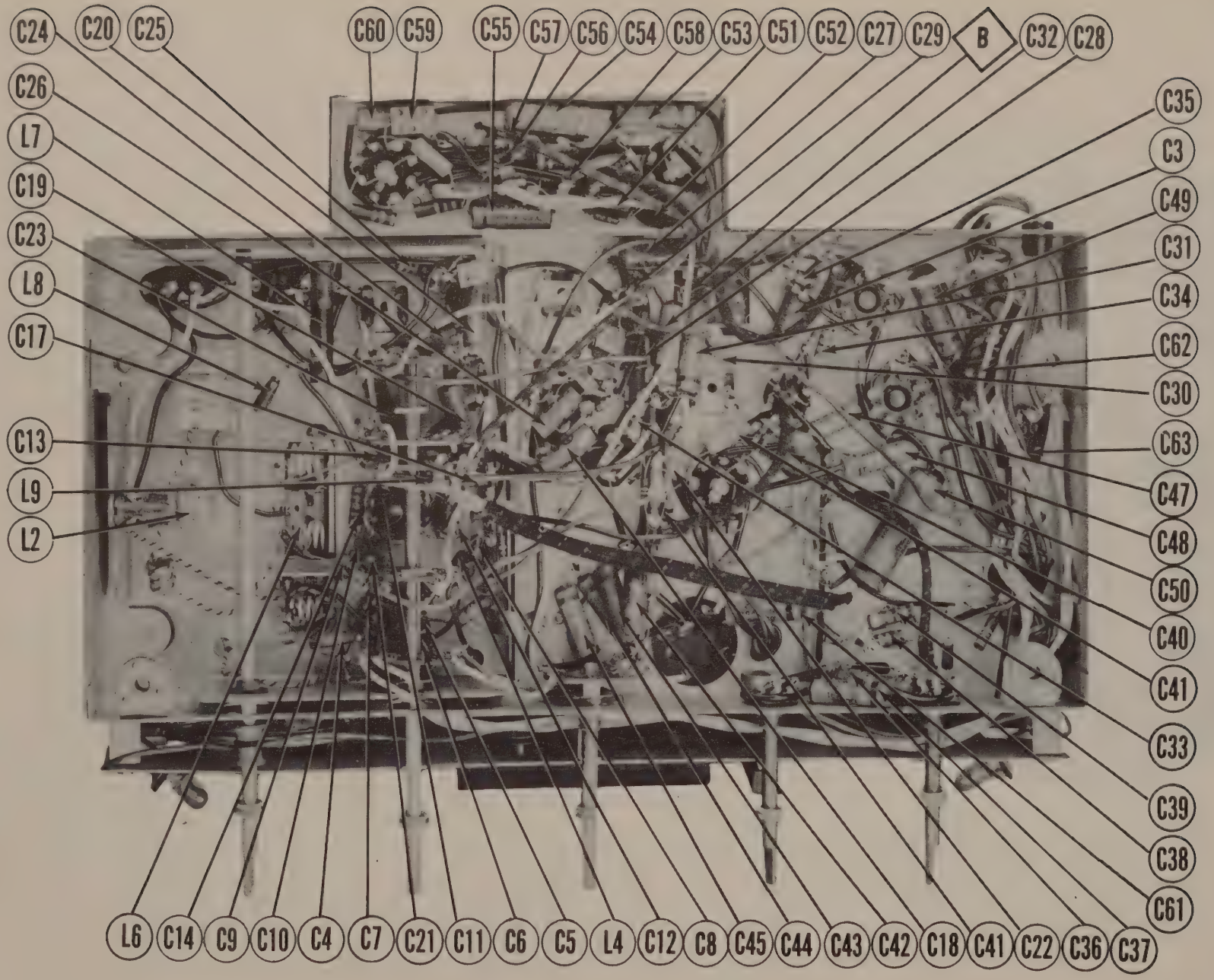
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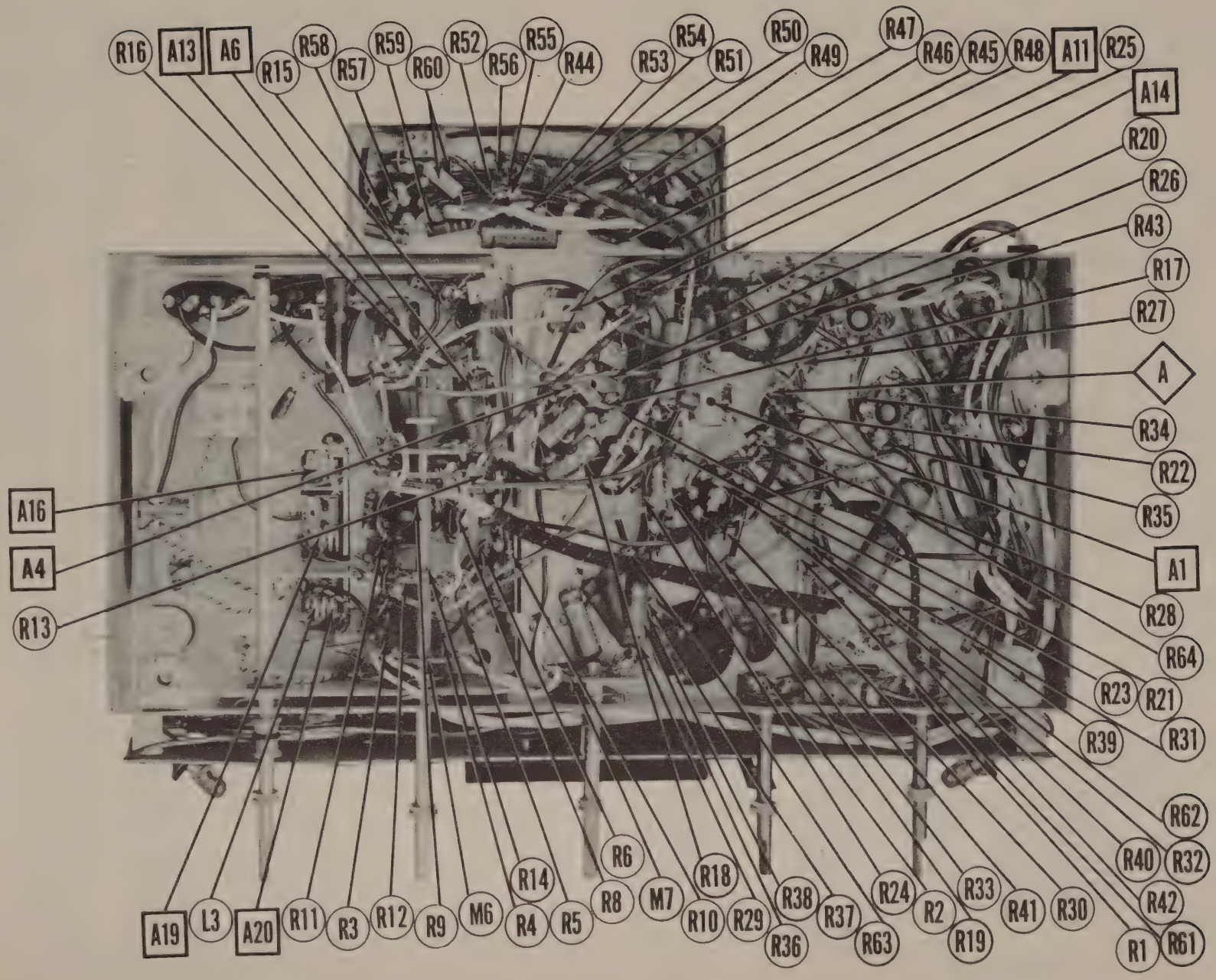


PHILCO
MODEL 50-1727

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	EIA BASE TYPE	NOTES
V1	FM RF Amp.	6AU6	6AU6	7BK	
V2	Converter	7F8	7F8	8BW	
V3	1st IF Amp.	6BJ6	6BJ6	7CM	
V4	2nd IF Amp.	6BJ6	6BJ6	7CM	
V5	DET.-AVC-AF Amp.	6T8	6T8	9E	
V6	Phase Inverter	7A4	7A4	5AC	
V7	Power Output	6V6GT	6V6GT	7AC	
V8	Power Output	6V6GT	6V6GT	7AC	
V9	Phono Scratch Amp.	7F7	7F7	8AC	
V10	Phono Reactance Control	7E7	7E7	8AE	
V11	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	40	475	30-2568-20	AF8X	UP5050		TVL-8	Filter
C2A	25	475	30-2556	AF52X	UP2250		EL-410*	▬ Filter
B	10	475						▲ Filter
C3	2	50	30-2417-7	E26E6	BBR2-50		TVA-12	Stabilizing Cap.
C4	33	500	30-1224	1468-00004	5W5Q4	GP1K-33	1FM-44	RF Coupling
C5	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	RF Screen Bypass
C6	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	RF Cath. Bypass
C7	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	RF Fil. Bypass
C8	1500		62-215001011	1467-0015	1W5D15	GP2L-0015	1FM-215	RF Plate Decoupling
C9	33	500	30-1224	1468-00004	5W5Q4	GP1K-33	1FM-44	RF Coupling
C10	220		62-122001001	1468-00025	5W5T25	GP2K-220	1FM-325	RF Coupling
C11	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	Osc. Grid Cap.
C12	750	500	60-10755301	1468-00075	1W5T8	GP2K-750	1FM-375	Conv. Cathode Bypass
C13	220		62-122001001	1468-00025	5W5T25	GP2K-220	1FM-325	Osc. Feedback
C14	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	Conv. Fil. Bypass
C15	220		30-1224-14			N220-336-220		Osc. Feedback
C16	1000		30-1224-15			N750-336-1000		Voltage Divider
C17	1500		62-215001011	1467-0015	1W5D15	GP2L-0015	1FM-215	Osc. Plate Decoupling
C18	.01	400	30-4641	P488-01	PTE4S1	821-01	TM-11	RF Bypass
C19	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Conv. Plate Decoupling
C20	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Conv. Plate Decoupling
C21	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	AVC Filter
C22	.01	400	30-4641	P488-01	PTE4S1	821-01	TM-11	AVC Filter
C23	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	AVC Filter
C24	.003	600	61-0109	P688-003	PTE6D3	GP2M-003	TM-23	1st IF Screen Bypass
C25	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	1st IF Fil. Bypass
C26	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	1st IF Plate Decoupling
C27	.05	200	61-0170	P288-05	PTE4S5		TM-15	2nd IF Cathode Bypass
C28	.003	600	61-0109	P688-003	PTE6D3	GP2M-003	TM-23	2nd IF Screen Bypass
C29	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	2nd IF Fil. Bypass
C30	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	2nd IF Plate Decoupling
C31	.04	400	45-3500-2	P488-04	PTE6S4		TM-14	De-emphasis
C32	.008	400	30-4112	P488-0075	PTE16D8	811-0075	MB-28	De-emphasis
C33	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	RF Bypass
C34	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	DET.-AVC Fil. Bypass
C35	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	RF Bypass
C36	.006	600	45-3500-7	P688-006	PTE6D6	GP2M-0056	TM-26	Audio Coupling
C37	.006	600	45-3500-7	P688-006	PTE6D6	GP2M-0056	TM-26	Tone Compensation
C38	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	Tone Compensation
C39	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	Tone Compensation
C40	.006	400	45-3500-7	P488-006	PTE6D6	GP2M-0056	TM-26	Audio Coupling
C41	100		62-110009001	1468-0001	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Bypass
C42	.006	400	45-3500-7	P488-006	PTE6D6	GP2M-0056	TM-26	Tone Compensation
C43	.003	600	61-0117	P688-003	PTE6D3	GP2M-003	TM-23	Tone Compensation
C44	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	Tone Compensation
C45	.0015	400	45-3500-6	P688-0015	1W5D15	GP2L-0015	1FM-215	Tone Compensation

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R37	4.7 Meg.	1/2	66-5473340	BTS-4.7 Meg.	Tone Compensation
R38	4.7 Meg.	1/2	66-5473340	BTS-4.7 Meg.	Tone Compensation
R39	120Ω	1/2	66-1123340	BW-1/2-120	Feedback-Wire Wound See Note 2
R40	4.7Ω	1/2	66-9473340	BW-1/2-4.7	Feedback-Wire Wound
R41	68KΩ	1/2	66-3683340	BTS-68K	Tone Compensation
R42	220KΩ	1/2	66-4223340	BTS-220K	Tone Compensation
R43	100KΩ	1/2	66-4103340	BTS-100K	Series Test Jack
R44	100KΩ	1/2	66-4103340	BTS-100K	Low Pass Filter
R45	1 Meg.	1/2	66-5103340	BTS-1 Meg.	Phono Scratch Amp. Grid
R46	2200Ω	1/2	66-2223340	BTS-2200	Phono Scratch Amp. Cathode
R47	560KΩ	1/2	66-4563340	BTS-560K	Phono Scratch Amp. Grid
R48	220KΩ	1/2	66-4223340	BTS-220K	Phono Scratch Amp. Plate
R49	33KΩ	1/2	66-3333340	BTS-33K	Phono Scratch Amp. Plate
R50	220KΩ	1/2	66-4223340	BTS-220K	Bias Filter
R51	120KΩ	1/2	66-4123340	BTS-120K	Diode Load
R52	560KΩ	1/2	66-4563340	BTS-560K	Diode Load
R53	1.5 Meg.	1/2	66-5153340	BTS-1.5 Meg.	Bias Network
R54	3.3 Meg.	1/2	66-5333340	BTS-3.3 Meg.	Bias Network
R55	220KΩ	1/2	66-4223340	BTS-220K	Bias Network
R56	680KΩ	1/2	66-4683340	BTS-680K	Bias Network
R57	1 Meg.	1/2	66-5103340	BTS-1 Meg.	Phono Reactance Control Grid
R58	33KΩ	1	66-3333340	BTA-33K	Phono Reactance Control Screen
R59	33KΩ	1	66-3333340	BTA-33K	Voltage Divider
R60	27KΩ	2	66-3273340	BT-2-27K	Phono Reactance Control Plate -See Note 1
R61	1.2 Meg.	1/2	66-5123340	BTS-1.2 Meg.	Bias Network
R62	330KΩ	1/2	66-4333340	BTS-330K	Bias Network
R63	10KΩ	2	33-1336-21	BT-2-10K	Filter
R64	18KΩ	10	33-1335-85	AB-18,000	Bleeder-Wire Wound

Note 1. Some models use two resistors in parallel to obtain required resistance and wattage.
Note 2. Some models use 100Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 1.15A	730VCT .143ADC	5VAC at 3A	6.3VAC at 4.2A	32-8378	P-4081 ‡ #	P-3155 ‡ #	PV-145 ‡

‡ Drill new mounting holes.
# Add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T2	8.6KΩ CT	10Ω	280Ω CT	.5Ω	32-8379	A-3824	A-2904 ¶	RO-305	¶ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: PHILCO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	700Ω	10Ω	36-1630		12E60 †	† Add 100Ω resistor in series with field.
	CONE DIA.	V. C. DIA.				
SP2	11 1/2"	2"				

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C46	470	500	60-10515307	1468-0005	5W5T5	GP2K-470	1FM-35	Audio Coupling
C47	.006	400	45-3500-7	P488-006	PTE6D6	GP2M-0056	TM-26	Audio Coupling
C48	.006	400	45-3500-7	P488-006	PTE6D6	GP2M-0056	TM-26	Audio Coupling
C49	.003	1000	61-0117	P1088-003	PTE16D3		MB-23	Output Plate Bypass
C50	.5	200	45-3500-10	P288-5	GT2P5		TC-5	Bias Filter
C51	150	500	60-10155407	1468-00015	5W5T15	GP1K-150	1FM-315	Audio Coupling
C52	330	500	60-10335407	1468-00035	5W5T3	GP2K-330	1FM-335	Audio Coupling
C53	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Bias Filter
C54	.02	400	61-0108	P488-02	PTE4S2		TM-12	Bias Filter
C55	.03	400	45-3500-1	P488-03	PTE6S3		TM-13	Bias Filter
C56	.002	600	61-0062	P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C57	.03	400	45-3500-1	P488-03	PTE6S3		TM-13	Bias Filter
C58	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Bias Filter
C59	220	500	60-10205307	1468-00025	5W5T25	GP2K-220	1FM-325	Reactance Feedback
C60	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	Audio Coupling
C61	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	RF Bypass
C62	.01	600	60-0120	P688-01	PTE6S1	821-01	TM-11	Line Filter
C63	.01	600	60-0120	P688-01	PTE6S1	821-01	TM-11	Line Filter

* Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	33-5535-19	QI8-139X	AT-116	Volume control, tapped at 1 Meg.
B	Shaft		Not Req.	Not Req.	FS-5	Attach to R1A per instructions
R2	1 Meg.	½	33-5539-52			Bass control

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R3	1 Meg.	½	66-5103340	BTS-1 Meg.	FM RF Grid
R4	82Ω	½	66-0823340		FM RF Cathode
R5	56KΩ	1	66-3563340	BTA-56K	FM RF Screen
R6	1000Ω	½	66-2103340	BTS-1000	FM RF Plate Decoupling
R7	1000Ω	½	66-2103340	BTS-1000	Conv. Cathode
R8	2200Ω	½	66-2223340	BTS-2200	Conv. Cathode
R9	15KΩ	½	66-3153340	BTS-15K	Osc. Grid
R10	47KΩ	½	66-3473340	BTS-47K	Conv. Plate Decoupling
R11	2.2 Meg.	½	66-5223340	BTS-2.2 Meg.	AVC Network
R12	470KΩ	½	66-4473340	BTS-470K	AVC Network
R13	27KΩ	½	66-3273340	BTS-27K	Osc. Plate Decoupling
R14	2.2 Meg.	½	66-5223340	BTS-2.2 Meg.	AVC Network
R15	390Ω	½	66-1393340		1st IF Cathode
R16	100Ω	½	66-1103340		1st IF Cathode
R17	33KΩ	½	66-3333340	BTS-33K	1st IF Screen
R18	1000Ω	½	66-2103340	BTS-1000	1st IF Plate Decoupling
R19	3.3 Meg.	½	66-5333340	BTS-3.3 Meg.	AVC Network
R20	82Ω	½	66-0823340	BW-½-82	2nd IF Cathode-Wire Wound
R21	33KΩ	½	66-3333340	BTS-33K	2nd IF Screen
R22	1000Ω	½	66-2103340	BTS-1000	2nd IF Plate Decoupling
R23	47KΩ	½	66-3473340	BTS-47K	Diode Filter
R24	330KΩ	½	66-4333340	BTS-330K	Diode Load
R25	6.8 Meg.	½	66-5683340	BTS-6.8 Meg.	Ratio Det. Diode Load
R26	100KΩ	½	66-4103340	BTS-100K	De-emphasis
R27	47KΩ	½	66-3473340	BTS-47K	Ratio Det. Diode Load
R28	10 Meg.	½	66-6103340	BTS-10 Meg.	AF Grid
R29	220KΩ	½	66-4223340	BTS-220K	AF Plate
R30	1 Meg.	½	66-5103340	BTS-1 Meg.	Phase Inv. Grid
R31	4700Ω	½	66-2473340	BTS-4700	Phase Inv. Cathode
R32	47KΩ	½	66-3473340	BTS-47K	Phase Inv. Cathode
R33	56KΩ	½	66-3563340	BTS-56K	Phase Inv. Plate
R34	330KΩ	½	66-4333340	BTS-330K	Output Grid
R35	330KΩ	½	66-4333340	BTS-330K	Output Grid
R36	4.7 Meg.	½	66-5473340	BTS-4.7 Meg.	Tone Compensation

SET 86 FOLDER 7

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA MEISSNER PART No.	
L1	AM Loop Antenna	0Ω		76-4337-1		1 turn around cabinet
L2	AM Ant. Coil	1.8Ω		32-4049-3		
L3	FM Ant. Coil	0Ω		32-4158-1		
L4	RF Choke	.5Ω		32-4061-2		
L5	FM RF Coil	0Ω		32-4159-1		
L6	FM Osc. Coil	0Ω		32-4018-5		
L7	AM Osc. Coil	9Ω		32-4221-3		
L8	RF Choke	.5Ω		32-4061-2		
L9	RF Choke	.5Ω		32-4061-2		
L10	Osc. Coil	2.5Ω		32-3779		900-1600KC
L11	Osc. Coil	2.5Ω		32-3779		850-1500KC
L12	Osc. Coil	4Ω		32-4059-3		650-1300KC
L13	Osc. Coil	4Ω		32-4059-3		600-1200KC
L14	Osc. Coil	4Ω		32-4059-3		540-1000KC
L15	1st FM IF	1Ω	1Ω	32-4257A		
L16	1st AM IF	7.5Ω	18Ω	32-4258A		Tertiary winding 18Ω
L17	2nd FM IF	1Ω	1Ω	32-4257-1A		
L18	2nd AM IF	9Ω	10Ω	32-4160-3A		
L19	Ratio Det. Trans.	1.5Ω	0Ω	32-4261-1		
L20	3rd AM IF	15Ω	15Ω	32-4240-2A	16-6678	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA PHILCO PART No.		NOTES
M1	Bayonet	6-8	.25	Blue	34-2040		Type #44 Radio Dial Light
M2	Bayonet	6-8	.25	Blue	34-2040		Type #44 Radio Dial Light
M3	Bayonet	6-8	.25	Blue	34-2040		Type #44 Cabinet Light
M4	Bayonet	6-8	.25	Blue	34-2040		Type #44 Phono Light

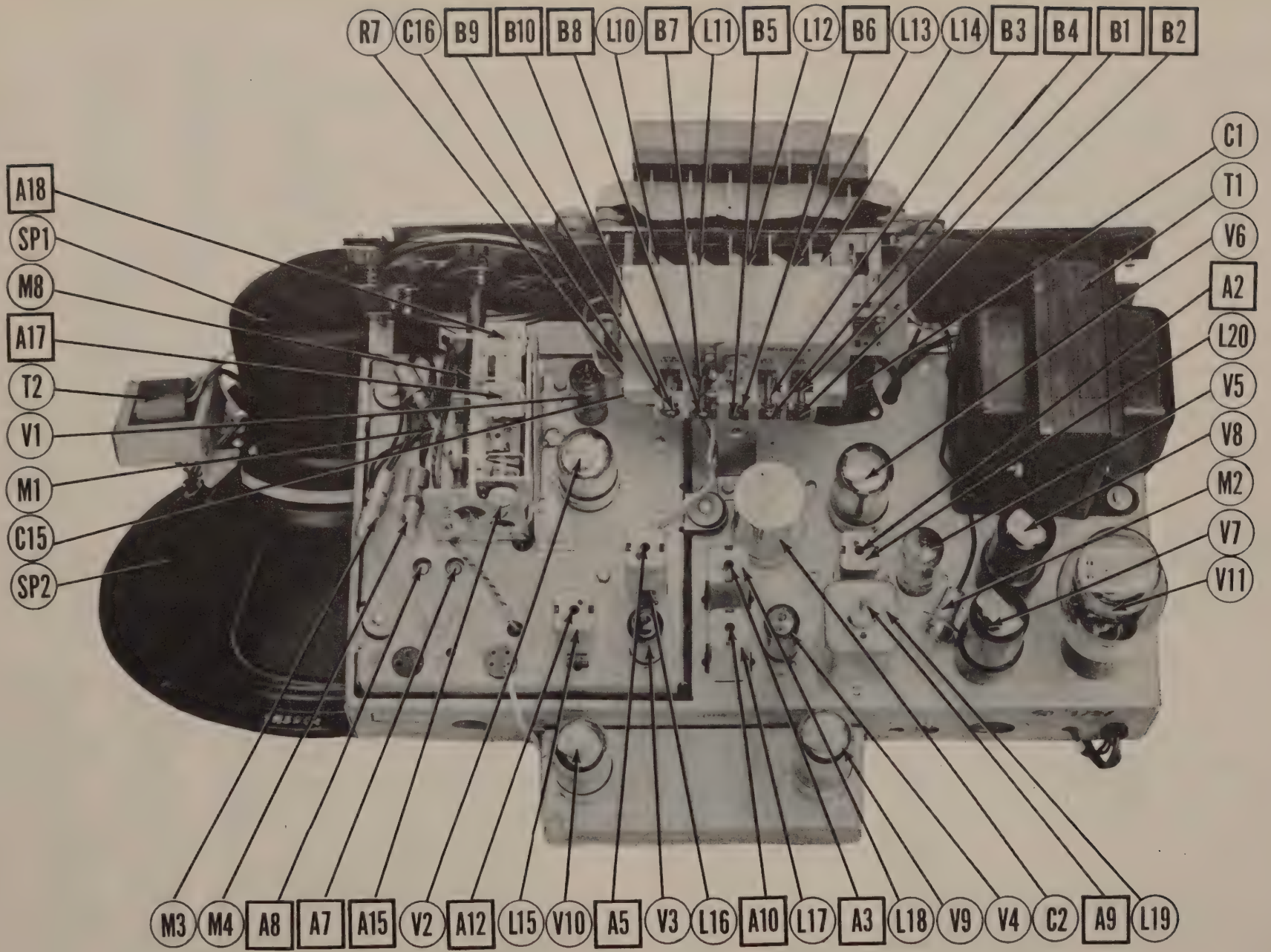
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA ASTATIC PART No.	REMARKS
M5	76-4649		

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M6	Switch	42-1877	Band-Phono
M7	Switch	42-1876	Tone
M8	Tuning Gang	31-2724-6	AM (24-522MMF, 11-247MMF)
A7, A8	Dual Trimmer	31-6476-8	BC Osc. Adj. / BC Ant. Adj.
	Trimmer Assembly	31-6479-3	B2, B4, B6, B8, B10
	PB Switch Assembly	42-1881	
	Cabinet	10731	
	Knob	54-4486	
	Dial Pointer	54-4648	
	Dial Scale	76-4298	Includes backplate

PHILCO
MODEL 50-1727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C16
B9
B10
B8
L10
B7
L11
B5
L12
B6
L13
L14
B3
B4
B1
B2
C1
T1
V6
A2
L20
V5
V8
M2
V7
V11
A18
SP1
M8
A17
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C15
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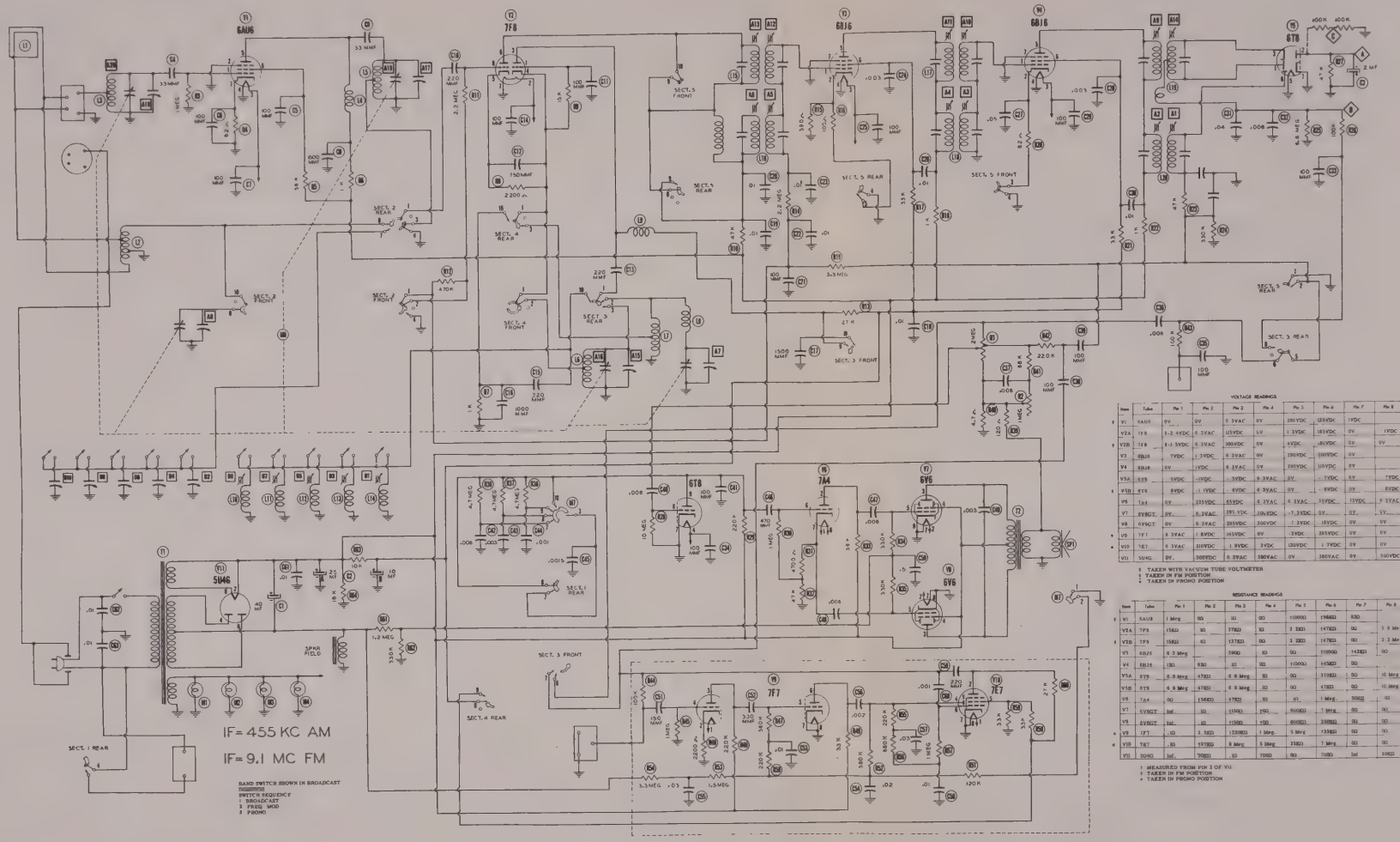
C2
A9
L19



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	0V	0V	6.3VAC	0V	280VDC	125VDC	1VDC		
V2A	7F8	1-2.4VDC	6.3VAC	115VDC	1V	1.3VDC	185VDC	0V	1VDC	
V2B	7F8	2-3.5VDC	6.3VAC	100VDC	0V	4VDC	180VDC	0V	0V	
V3	6BJ6	7VDC	1.3VDC	6.3VAC	0V	290VDC	200VDC	0V		
V4	6BJ6	0V	1VDC	6.3VAC	0V	290VDC	110VDC	0V		
V5A	6T8	5VDC	-1VDC	5VDC	8.3VAC	0V	1VDC	0V	1VDC	92VDC
V5B	6T8	8VDC	-1.1VDC	9VDC	6.3VAC	0V	6VDC	0V	8VDC	92VDC
V6	7A4	0V	225VDC	85VDC	8.3VAC	6.3VAC	35VDC	125VDC	0.3VAC	
V7	6V6GT	0V	6.3VAC	285 VDC	310VDC	7.2VDC	0V	0V	5V	
V8	6V6GT	0V	6.3VAC	295VDC	310VDC	7.2VDC	16VDC	0V	0V	
V9	7F7	6.3VAC	1.8VDC	145VDC	0V	3VDC	295VDC	0V	0V	
V10	7E7	6.3VAC	210VDC	1.8VDC	3VDC	120VDC	1.1VDC	0V	0V	
V11	5U4G	0V	360VDC	6.3VAC	380VAC	0V	380VAC	0V	350VDC	

1 TAKEN WITH VACUUM TUBE VOLTMETER
2 TAKEN IN FM POSITION
3 TAKEN IN PHONO POSITION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	1 Meg	0Ω	0Ω	0Ω	1100Ω	1560Ω	83Ω		
V2A	7F8	150Ω	0Ω	378Ω	0Ω	2.2KΩ	1478Ω	0Ω	3.8 Meg	
V2B	7F8	150Ω	0Ω	1378Ω	0Ω	2.2KΩ	1478Ω	0Ω	3.8 Meg	
V3	6BJ6	6.2 Meg		390Ω	0Ω	0Ω	1050Ω	1438Ω	0Ω	
V4	6BJ6	1MΩ	83Ω	0Ω	0Ω	1100Ω	1458Ω	0Ω		
V5A	6T8	0.8 Meg	678Ω	0.8 Meg	0Ω	0Ω	378Ω	0Ω	.10 Meg	†230Ω‡
V5B	6T8	0.9 Meg	678Ω	0.8 Meg	0Ω	0Ω	478Ω	0Ω	.10 Meg	†280Ω‡
V6	7A4	0Ω	150Ω‡	478Ω	0Ω	0Ω	1 Meg	50KΩ	0Ω	
V7	6V6GT	Inf.	0Ω	1150Ω	190Ω	860Ω‡	7 Meg	0Ω	0Ω	
V8	6V6GT	Inf.	0Ω	1150Ω	190Ω	860Ω‡	350Ω‡	0Ω	0Ω	
V9	7F7	0Ω	3.5Ω‡	1230Ω‡	1 Meg	5 Meg	1330Ω‡	0Ω	0Ω	
V10	7E7	0Ω	197Ω‡	8 Meg	5 Meg	25Ω‡	7 Meg	0Ω	0Ω	
V11	5U4G	Inf.	70Ω‡	0Ω	70Ω‡	0Ω	70Ω‡	Inf	30Ω‡	

‡ MEASURED FROM PIN 2 OF V11
† TAKEN IN FM POSITION
# TAKEN IN PHONO POSITION

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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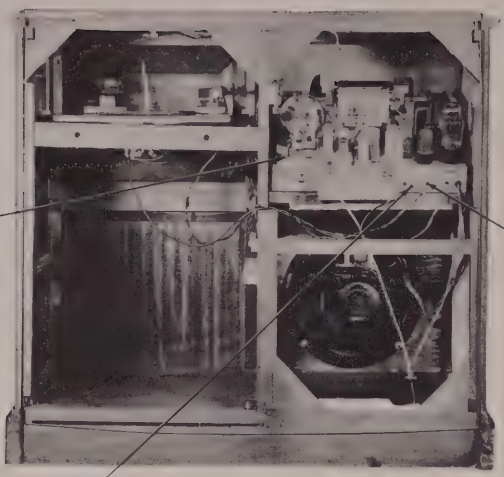
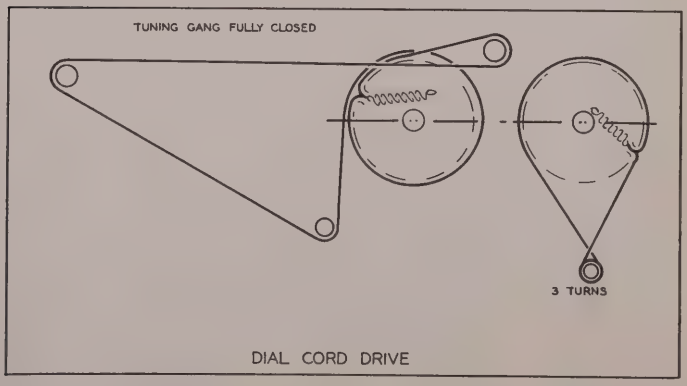


1. Remove five push-on type control knobs.
2. Remove fifteen phillips screws holding rear cover of radio section. Remove cover.
3. Remove phono motor power plug and pick-up plug.
4. Remove phono compartment lamp socket and cabinet lamp socket from clamps.
5. Remove speaker plug.
6. Remove loop antenna plug.
7. Remove two phillips screws holding pushbutton assembly.
8. Remove four 3/8" hex head bolts holding chassis. Remove chassis.
9. Remove four 7/16" hex nuts holding speaker. Remove speaker.



DIAL CORD DRIVE

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The speaker must be plugged in before turning the set on.
To set dial pointer turn tuning gang fully closed and set the pointer 4 7/8 inches to the right of the left hand end of the dial backplate.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (Grid) of 7F8 (V2). Low side to chassis.	455KC (400 ~ Mod.)	AM (second pos. CW)	Tuning gang fully closed	Across voice coil	A1, A2, A3, A4, A5, A6	Adjust for maximum output in the order given. Do not repeat these adjustments.
2.		Loop	1600KC	"	Set pointer 10 9/16 ins. to the right of left hand end of dial backplate.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	"	Set pointer 10 3/16 ins. to the right of left hand end of dial backplate.	"	A8	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point A to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.1MFD	High side to pin 1 (Grid) of 6BJ6 (V4). Low side to chassis.	9.1MC (Unmod.)	FM (third pos. CW)	Tuning gang fully closed.	DC Probe to Point (A) Common to chassis.	A9	Adjust for maximum deflection.
5.	.1MFD	High side to pin 1 (Grid) of 6BJ6 (V3). Low side to chassis.	"	"	"	"	A10, A11	"
6.	.1MFD	High side to pin 8 (Grid) of 7F8 (V2). Low side to chassis.	"	"	"	"	A12, A13	"
7.	.1MFD	"	"	"	"	DC Probe to Point (B) Common to Point (C)	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.1MFD	High side to pin 1 (Grid) of 6BJ6 (V3). Low side to chassis.	9.1MC (450KC Sweep)	FM (third pos. CW)	Point of non-interference	Vert. Amp. to Point (A) Low side to chassis.	A9, A10, A11	Disconnect stabilizer capacitor C3. Adjust for maximum amplitude and symmetry as per Fig 1.
5.	.1MFD	High side to pin 8 (Grid) of 7F8 (V2). Low side to chassis.	"	"	"	"	A12, A13	"
6.	.1MFD	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A14	Adjust A14 so 9.1MC occurs at center of crossover lines as per Fig 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines. Continue with step 8.

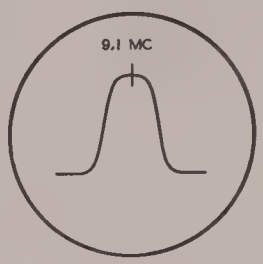


FIG. 1

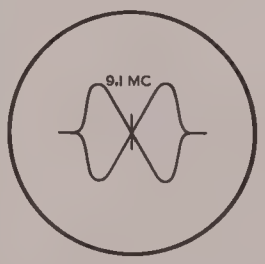


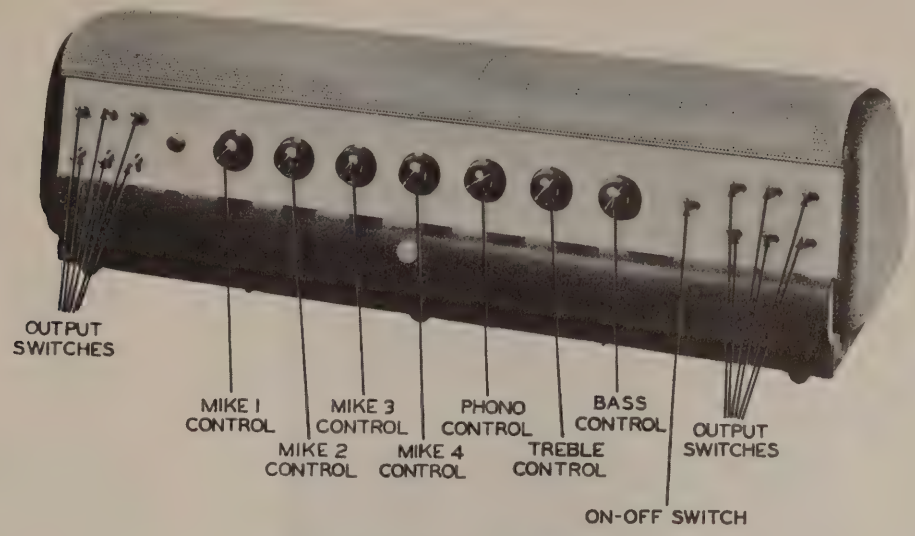
FIG. 2

FM RF ALIGNMENT

The dummy antenna and signal generator coupling for step 11 consists of two dipole antennas. These dipoles are each made from two 30 inch pieces of insulated wire. Connect the signal generator output leads to one dipole and connect the remaining one between terminals 3 and 4 of the FM antenna socket. Place the two dipoles approximately 3 feet apart.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	300Ω carbon res.	High side to terminal 4 of FM antenna socket. Low side to chassis.	105MC (Unmod.)	FM	Set pointer 9 9/16 ins. to the right of left hand end of dial backplate.	DC Probe to Point (A) Common to chassis.	A15	Adjust for maximum deflection.
9.	"	"	92MC	"	Set pointer 6 1/2 ins. to the right of left hand end of dial backplate.	"	A16	Expand or compress coils turns for maximum deflection. Repeat steps 8 and 9 until no further improvement can be made.
10.	"	"	105MC	"	See step 8	"	A17, A18	Adjust for maximum deflection. Rock tuning gang while adjusting A17.
11.		See instructions above	92MC	"	See step 9	"	A19, A20	Expand or compress coil turns for maximum deflection. Rock tuning gang while adjusting A19. Repeat steps 10 and 11 until no further improvement can be made.

RCA VICTOR MODELS MI-12291, MI-12292, MI-12293, MI-12294



RCA VICTOR MODEL MI-12294

TRADE NAME	RCA Victor, Models MI-12291, MI-12292, MI-12293, MI-12294
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey
TYPE SET	AC Operated 4 Channel Amplifier
TUBES(THIRTEEN)	Types 6J7 Mic. #1 Pre Amp., 6J7 Mic. #2 Pre Amp., 6J7 Mic. #3 Pre Amp., 6J7 Mic. #4 Pre Amp., 6J7 1st AF Amp., 6J5 or 6C5 2nd AF Amp., 6J5 or 6C5 Phase Inverter, (4) 807 Power Output, (2) 5U4G Rectifier
POWER SUPPLY	105-125 or 210-250 Volts AC RATING 2.5 Amp. at 117 Volts AC

INPUT CHANNELS

Four separate microphone input stages, with built-in mixing controls, are provided for use with microphones or low-level lines. Each of the input stages is resistance-capacity coupled to the mixer stage.

Two jacks are provided for phonograph pickup connections. The jack marked PHONO-1 is connected to the control grid circuit of the MIC-3 input stage; and the other jack, marked PHONO-2, is connected through a volume control to the control grid circuit of the mixer tube. The PHONO-1 jack is for use with a low-level phonograph pickup.

The MI-12292 and MI-12294 amplifiers each have four low-impedance high-gain inputs, one high-impedance high-gain input and one high-impedance moderate-gain input. The MI-12291 and MI-12293 each have four high-impedance high-gain inputs and one high-impedance moderate-gain input.

OUTPUT CONNECTIONS

Leads from the output transformer in the amplifier are connected to a terminal board on the rear of the chassis. The terminals on this board are marked 0, 4, 8, 15, 60 and 250 ohms. In the following table the first column gives the connections necessary for the load impedances shown in the last column.

OUTPUT CONNECTIONS

Terminals	Volts Output (at 50 watts)	Load Impedance (ohms)
4 and 8	5.7	0.67*
8 and 15	7.4	1.1*
4 and 15	13	3.5*
0 and 4	14	4
0 and 8	20	8
0 and 15	27	15
8 and 60	34	24
4 and 60	41	33
0 and 60	54	60
15 and 250	84	143
8 and 250	92	171
4 and 250	97	191
0 and 250	111	250

* Use only for light loads, such as for monitoring.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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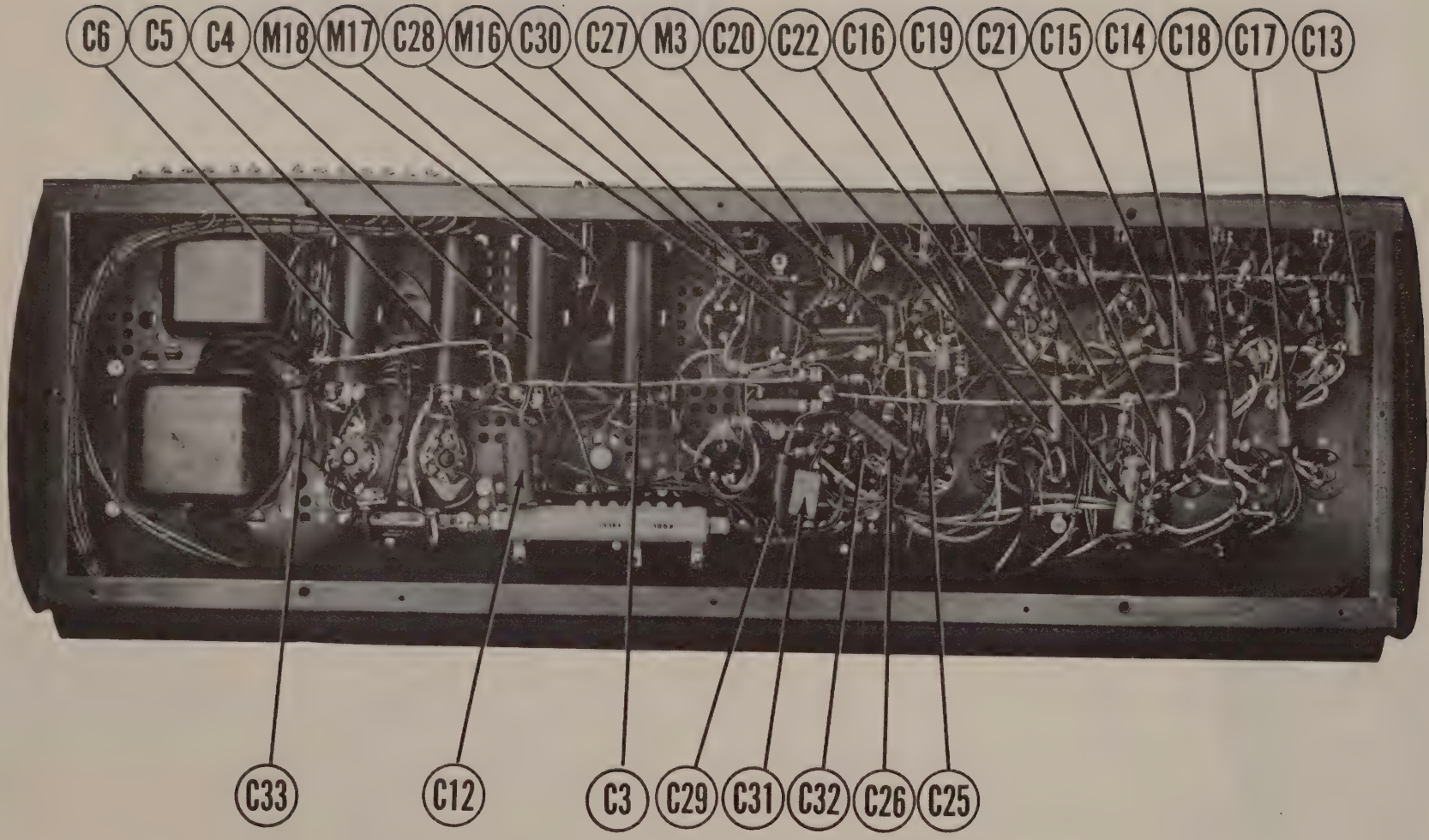
C6
C5
C4
M18
M17
C28
M16
C30
C27
M3
C20
C22
C16
C19
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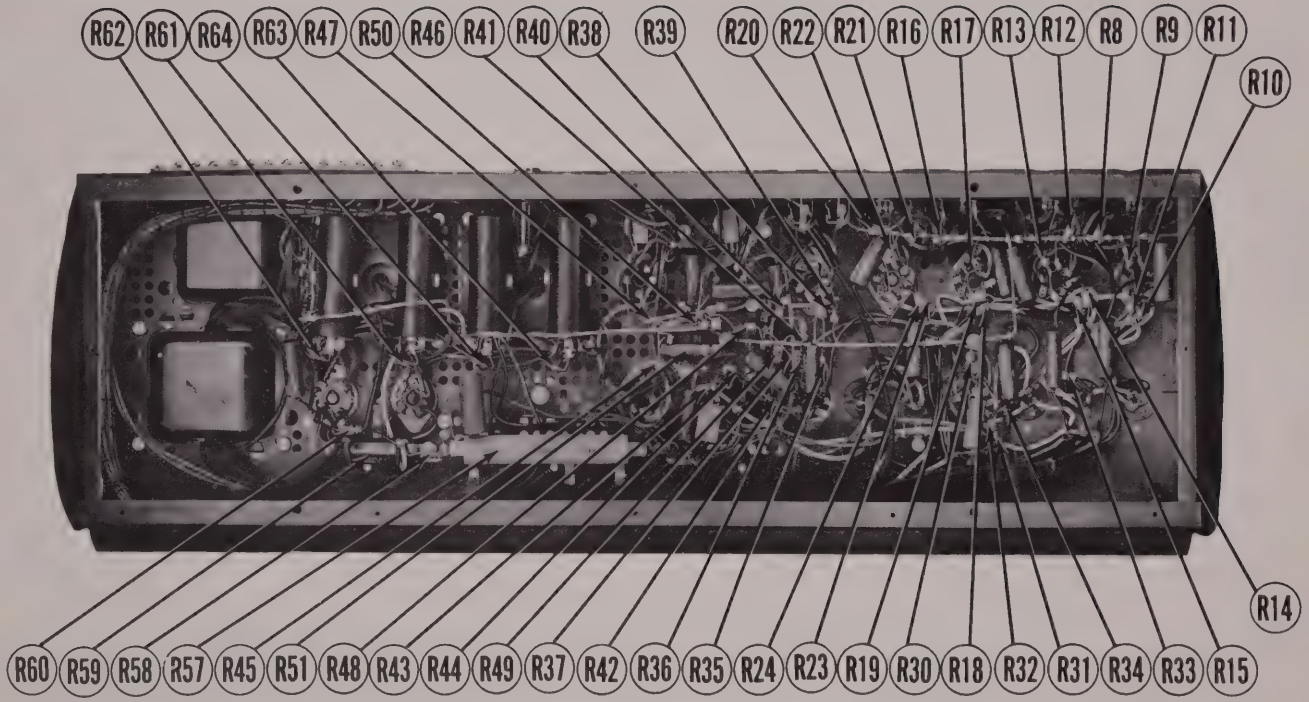
C31
C32
C26
C25


R62
R61
R64
R63
R47
R50
R46
R41
R40
R38
R39
R20
R22
R21
R16
R17
R13
R12
R8
R9
R11
R10
R14
R60
R59
R58
R57
R45
R51
R48
R43
R44
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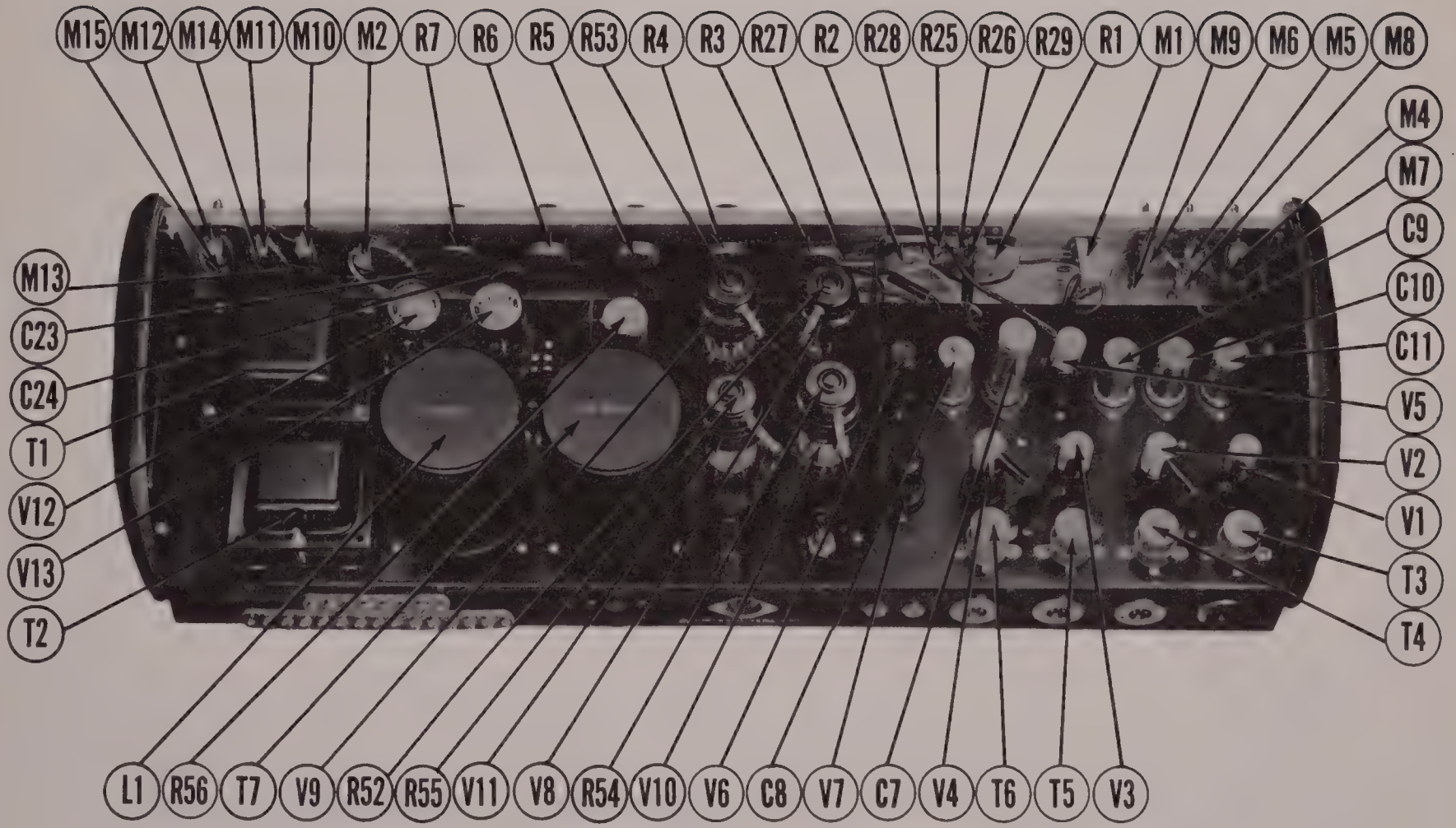
R18
R32
R31
R34
R33
R15


M15
M12
M14
M11
M10
M2
R7
R6
R5
R53
R4
R3
R27
R2
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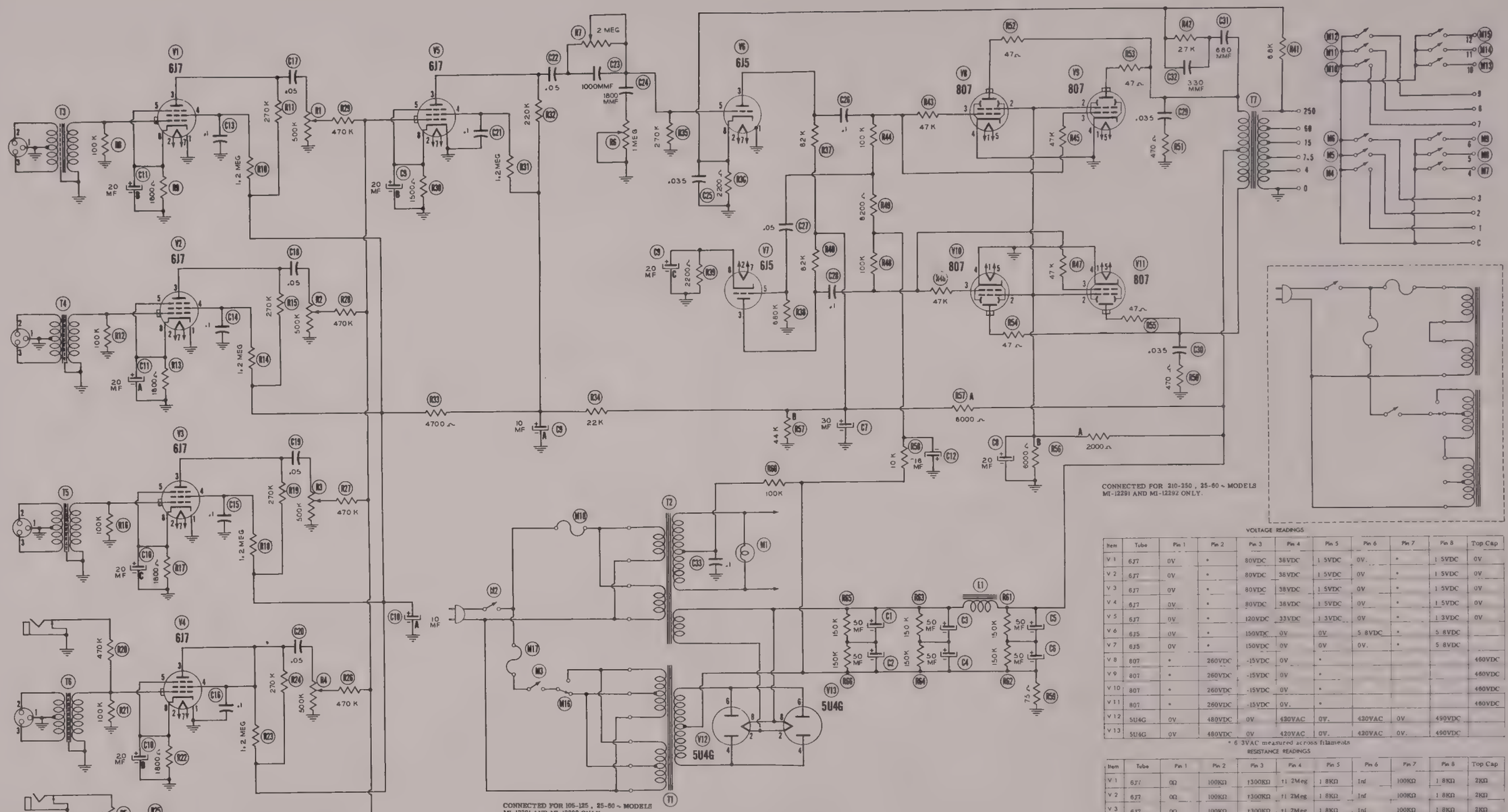
R25
R26
R29
R1
M1
M9
M6
M5
M8
M4
M7
C9
C10
C11
V5
V2
V1
T3
T4
M13
C23
C24
T1
V12
V13
T2
L1
R56
T7
V9
R52
R55
V11
V8
R54
V10
V6
C8
V7
C7
V4
T6
T5
V3



CONNECTED FOR 105-125 , 25-60 ~ MODELS MI-12291 AND MI-12292 ONLY

CONNECTED FOR 210-250 , 25-60 ~ MODELS MI-12291 AND MI-12292 ONLY.

ON MODELS MI-12291 AND MI-12293 THE INPUT TRANSFORMERS ARE OMITTED AND PIN 2 OF MIC INPUT JACK CONNECTS TO JUNCTION OF GRID AND THE GRID LOAD.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6J7	0V	*	80VDC	38VDC	1.5VDC	0V.	*	1.5VDC	0V
V 2	6J7	0V	*	80VDC	38VDC	1.5VDC	0V	*	1.5VDC	0V
V 3	6J7	0V	*	80VDC	38VDC	1.5VDC	0V	*	1.5VDC	0V
V 4	6J7	0V	*	80VDC	38VDC	1.5VDC	0V	*	1.5VDC	0V
V 5	6J7	0V	*	120VDC	33VDC	1.3VDC	0V	*	1.3VDC	0V
V 6	6J5	0V	*	150VDC	0V	0V	5.8VDC	*	5.8VDC	
V 7	6J5	0V	*	150VDC	0V	0V	0V.	*	5.8VDC	
V 8	807	*	260VDC	-15VDC	0V	*				460VDC
V 9	807	*	260VDC	-15VDC	0V	*				460VDC
V 10	807	*	260VDC	-15VDC	0V	*				460VDC
V 11	807	*	260VDC	-15VDC	0V.	*				460VDC
V 12	5U4G	0V	480VDC	0V	420VAC	0V.	420VAC	0V	490VDC	
V 13	5U4G	0V	480VDC	0V	420VAC	0V.	420VAC	0V.	490VDC	

* 6.3VAC measured across filaments

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6J7	0Ω	100KΩ	†300KΩ	†1.2Meg	1.8KΩ	Inf	100KΩ	1.8KΩ	2KΩ
V 2	6J7	0Ω	100KΩ	†300KΩ	†1.2Meg	1.8KΩ	Inf	100KΩ	1.8KΩ	2KΩ
V 3	6J7	0Ω	100KΩ	†300KΩ	†1.2Meg	1.8KΩ	Inf	100KΩ	1.8KΩ	2KΩ
V 4	6J7	0Ω	100KΩ	†300KΩ	†1.2Meg	1.8KΩ	Inf	100KΩ	1.8KΩ	2KΩ
V 5	6J7	0Ω	100KΩ	†250KΩ	†1.2Meg	1.5KΩ	Inf	100KΩ	1.8KΩ	100KΩ
V 6	6J5	0Ω	100KΩ	†82KΩ	Inf	270KΩ	2.2KΩ	100KΩ	2.2KΩ	
V 7	6J5	0Ω	100KΩ	†82KΩ	Inf	680KΩ	Inf	100KΩ	2.2KΩ	
V 8	807	100KΩ	†2KΩ	150KΩ	0Ω	100KΩ				†140Ω
V 9	807	100KΩ	†2KΩ	150KΩ	0Ω	100KΩ				†140Ω
V 10	807	100KΩ	†2KΩ	150KΩ	0Ω	100KΩ				†140Ω
V 11	807	100KΩ	†2KΩ	150KΩ	0Ω	100KΩ				†140Ω
V 12	5U4G	Inf	6.5KΩ	Inf	•32Ω	Inf	•32Ω	Inf	6.5KΩ	
V 13	5U4G	Inf	6.5KΩ	Inf	•32Ω	Inf	•32Ω	Inf	6.5KΩ	

† Measured from pin 8 of V13.
• Measured from power transformer center tap and R59.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Mic. #1 Pre Amp.	6J7	6J7	7R	
V2	Mic. #2 Pre Amp.	6J7	6J7	7R	
V3	Mic. #3 Pre Amp.	6J7	6J7	7R	
V4	Mic. #4 Pre Amp.	6J7	6J7	7R	
V5	1st AF Amp.	6J7	6J7	7R	
V6A	2nd AF Amp.	6J5	6J5	6Q	
B	2nd AF Amp.	6C5	6C5	6Q	
V7A	Phase Inverter	6J5	6J5	6Q	
B	Phase Inverter	6C5	6C5	6Q	
V8	Power Output	807	807		
V9	Power Output	807	807		
V10	Power Output	807	807		
V11	Power Output	807	807		
V12	Rectifier	5U4G	5U4G	5T	
V13	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	50	350	35408	AF10J	UP5035		EL-5	Filter See Note
C2	50	350	35408	AF10J	UP5035		EL-5	Filter See Note
C3	50	350	35408	AF10J	UP5035		EL-5	Filter
C4	50	350	35408	AF10J	UP5035		EL-5	Filter
C5	50	350	35408	AF10J	UP5035		EL-5	Filter
C6	50	350	35408	AF10J	UP5035		EL-5	Filter
C7	30	450	34065	AFH6J	UP3045		EL-3	Decoupling
C8	20	450	32400	AF4J	UP2045		EL-2	Output Screen Bypass
C9A	10	450	35472	AF24J4A	UP2145C		EL-312	■ Decoupling
B	20	25						▲ 1st AF Amp. Cath. Bypass
C	20	25						Phase Inv. Cath. Bypass
C10A	10	450	35472	AF24J4A	UP2145C		EL-312	■ Decoupling
B	20	25						▲ Mic. #4 Pre-Amp. Cath. Bypass
C	20	25						Mic. #3 Pre-Amp. Cath. Bypass
C11A	20	25	34061	AF88A	UP2225		EL-242	■ Mic. #2 Pre-Amp. Cath. Bypass
B	20	25						▲ Mic. #1 Pre-Amp. Cath. Bypass
C12	16	150	31323	PRS150/16	BR1615		UT-161	Bias Filter
C13	.1	400	70617	P488-1	PTE4P1		TM-1	Mic. 1 Pre-Amp. Screen Bypass
C14	.1	400	70617	P488-1	PTE4P1		TM-1	Mic. 2 Pre-Amp. Screen Bypass
C15	.1	400	70617	P488-1	PTE4P1		TM-1	Mic. 3 Pre Amp. Screen Bypass
C16	.1	400	70617	P488-1	PTE4P1		TM-1	Mic. 4 Pre Amp. Screen Bypass
C17	.05	400	70615	P488-05	PTE4S5		TM-15	Audio Coupling
C18	.05	400	70615	P488-05	PTE4S5		TM-15	Audio Coupling
C19	.05	400	70615	P488-05	PTE4S5		TM-15	Audio Coupling
C20	.05	400	70615	P488-05	PTE4S5		TM-15	Audio Coupling
C21	.1	400	70617	P488-1	PTE4P1		TM-1	1st AF Amp. Screen Bypass
C22	.05	400	70615	P488-05	PTE4S5		TM-15	Audio Coupling
C23	1000	500	39652	1467-005	1W5D1	GP2L-001	1FM-21	Tone Compensation
C24	1800	500	39658			GP2M-0018		Tone Compensation
C25	.035	200	70614	P488-033	PTE6S3		TM-13	2nd AF Amp. Cath. Bypass
C26	.1	400	70617	P488-1	PTE4P1		TM-1	Audio Coupling
C27	.05	400	70615	P488-05	PTE4S5		TM-15	Audio Coupling
C28	.1	400	70617	P488-1	PTE4P1		TM-1	Audio Coupling
C29	.035	1200	70646	P1688-033	PTE16S3		MB-13	Tone Compensation
C30	.035	1200	70646	P1688-033	PTE16S3		MB-13	Tone Compensation
C31	680	1000	39648					AF Feedback
C32	330	500	39640	1468-00035	5W5T3	GP2K-330	1FM-325	Tone Compensation
C33	.1	400	70617	P488-1	PTE4P1		TM-1	Filament Bypass

Note. Used only on models MI-12291 and MI-12292.

SCT 86 FOLDER 8

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R61	150KΩ	*	30493	BTS-150K	Bleeder Network
R62	150KΩ	*	30493	BTS-150K	Bleeder Network
R63	150KΩ	*	30493	BTS-150K	Bleeder Network
R64	150KΩ	*	30493	BTS-150K	Bleeder Network
R65	150KΩ	*	30493	BTS-150K	Bleeder Network See Note 1
R66	150KΩ	*	30493	BTS-150K	Bleeder Network See Note 1

* Set slider 6,000Ω from one end.
Note 1. Used in models MI-12291 and 12292 only.

TRANSFORMER (PLATE)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1A	117VAC at 1.95A	840VCT .290ADC tapped at 780VCT			30170 †			
B					30362 #			

† Used in models MI-12293 and MI-12294.
# Used in models MI-12291 and MI-12292.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T2A	117VAC at .55A	5VAC at 6A	6.3VAC at 6A		30171 †	P-4022 ‡		
B					30363 #			

† Used in models MI-12293 and MI-12294.
# Used in models MI-12291 and MI-12292.
‡ Drill new mounting holes.

TRANSFORMER (INPUT)

ITEM No.	RATING: TURNS RATIO PRI. TO SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T3	1 to 12	80Ω CT	210Ω	52725				
T4	1 to 12	80Ω CT	210Ω	52725				
T5	1 to 12	80Ω CT	210Ω	52725				
T6	1 to 12	80Ω CT	210Ω	52725				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T7	3.7KΩ CT	250Ω 60Ω 15Ω 8Ω 4Ω	132Ω CT	11.5Ω 4.2Ω .7Ω .5Ω .35Ω	30173		A-3133 ‡		‡ Drill new mounting holes.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	CLAROSTAT PART No.	
R1	500KΩ	½	35473	Q13-133	M-60-Z	Mic. 1 Volume control
R2	500KΩ	½	35473	Q13-133	M-60-Z	Mic. 2 Volume control
R3	500KΩ	½	35473	Q13-133	M-60-Z	Mic. 3 Volume control
R4	500KΩ	½	35473	Q13-133	M-60-Z	Mic. 4 Volume control
R5	500KΩ	½	35473	Q13-133	M-60-Z	Phono Volume control
R6	1 Meg.	½	35474	Q13-137	M-63-Z	High tone control
R7	2 Meg.	½	35475			Low tone control

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	
R8	100KΩ	½	3252	BTS-100K	Mic. 1 Pre Amp. Grid
R9	1800Ω	½	30930	BTS-1800	Mic. Pre Amp. Cathode
R10	1.2 Meg.	½	30162	BTS-1.2 Meg.	Mic. 1 Pre Amp. Screen
R11	270KΩ	½	30651	BTS-270K	Mic. 1 Pre Amp. Plate
R12	100KΩ	½	3252	BTS-100K	Mic. 2 Pre Amp. Grid
R13	1800Ω	½	30930	BTS-1800	Mic. 2 Pre Amp. Cathode
R14	1.2 Meg.	½	30162	BTS-1.2 Meg.	Mic. 2 Pre Amp. Screen
R15	270KΩ	½	30651	BTS-270K	Mic. 2 Pre Amp. Plate
R16	100KΩ	½	3252	BTS-100K	Mic. 3 Pre Amp. Grid
R17	1800Ω	½	30930	BTS-1800	Mic. 3 Pre Amp. Cathode
R18	1.2 Meg.	½	30162	BTS-1.2 Meg.	Mic. 3 Pre Amp. Screen
R19	270KΩ	½	30651	BTS-270K	Mic. 3 Pre Amp. Plate
R20	470KΩ	½	30648	BTS-470K	Tone Compensation
R21	100KΩ	½	3252	BTS-100K	Mic. 4 Pre Amp. Grid
R22	1800Ω	½	30930	BTS-1800	Mic. 4 Pre Amp. Cathode
R23	1.2 Meg.	½	30162	BTS-1.2 Meg.	Mic. 4 Pre Amp. Screen
R24	270KΩ	½	30651	BTS-270K	Mic. 4 Pre Amp. Plate
R25	470KΩ	½	30648	BTS-470K	Isolation
R26	470KΩ	½	30648	BTS-470K	Isolation
R27	470KΩ	½	30648	BTS-470K	Isolation
R28	470KΩ	½	30648	BTS-470K	Isolation
R29	470KΩ	½	30648	BTS-470K	Isolation
R30	1500Ω	½	30654	BTS-1500	1st AF Cathode
R31	1.2 Meg.	½	30162	BTS-1.2 Meg.	1st AF Screen
R32	220KΩ	½	14583	BTS-220K	1st AF Plate
R33	4700Ω	½	30787	BTS-4700	Decoupling
R34	22KΩ	1	43005	BTA-22K	Decoupling
R35	270KΩ	½	30651	BTS-270K	2nd AF Grid
R36	2200Ω	½	34767	BTS-2200	2nd AF Cathode
R37	82KΩ	½	14023	BTS-82K	2nd AF Plate
R38	680KΩ	½	30562	BTS-680K	Phase Inv. Grid
R39	2200Ω	½	34767	BTS-2200	Phase Inv. Cathode
R40	82KΩ	½	14023	BTS-82K	Phase Inv. Plate
R41	68KΩ	½	14138	BTS-68K	Feedback
R42	27KΩ	1	35405	BTA-27K	Tone Compensation
R43	47KΩ	½	30787	BTS-47K	Output Grid
R44	100KΩ	½	3252	BTS-100K	Output Grid
R45	47KΩ	½	30787	BTS-47K	Output Grid
R46	47KΩ	½	30787	BTS-47K	Output Grid
R47	47KΩ	½	30787	BTS-47K	Output Grid
R48	100KΩ	½	3252	BTS-100K	Output Grid
R49	8200Ω	½	14250	BTS-8200	Output Grid
R50	470Ω	2	19478	BT-2-470	Tone Compensation
R51	470Ω	2	19478	BT-2-470	Tone Compensation
R52	47Ω	½	30732		Parasitic Supp.
R53	47Ω	½	30732		Parasitic Supp.
R54	47Ω	½	30732		Parasitic Supp.
R55	47Ω	½	30732		Parasitic Supp.
R56A	2000Ω	100	35404		Filter, Wire Wound
B	6000				Bleeder, Wire Wound
R57A	6000Ω	50	35403		Filter, Wire Wound
B	44,000Ω			EPA-50,000 *	Bleeder, Wire Wound
R58	10KΩ	½	3078	BTS-10K	Bias Network
R59	75Ω	25	35405		Bias Network, Wire Wound
R60	100KΩ	½	3252	BTS-100K	Bias Network

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 cps)	RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.290A	81Ω	5.5 Henries	30172			RC-8250	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA PART No.		
M1	Bayonet	6-8	.25	Blue	11891		Type #44

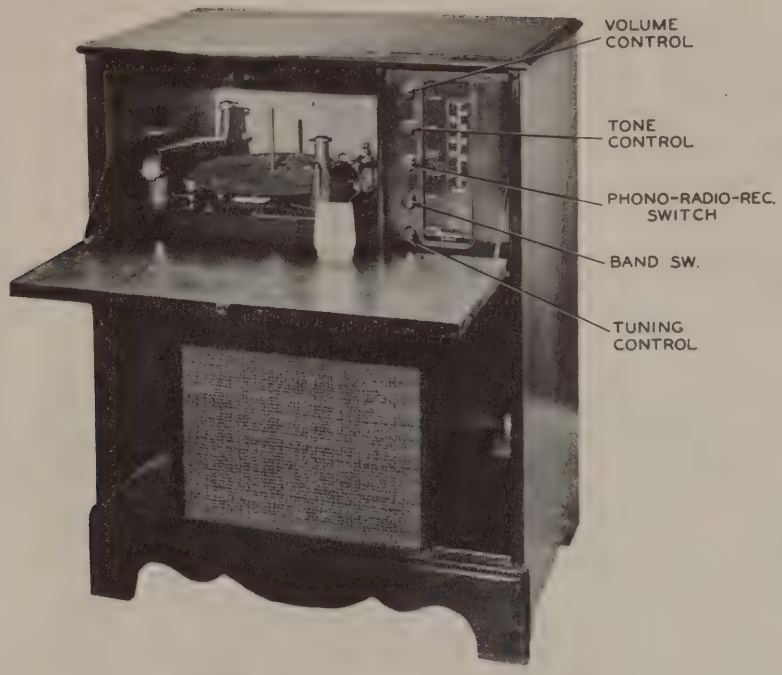
MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M2	Switch	44376	On-Off
M3	Switch	19433	Interlock
M4	Switch	44376	Output #1
M5	Switch	44376	Output #2
M6	Switch	44376	Output #3
M7	Switch	44376	Output #4
M8	Switch	44376	Output #5
M9	Switch	44376	Output #6
M10	Switch	44376	Output #7
M11	Switch	44376	Output #8
M12	Switch	44376	Output #9
M13	Switch	44376	Output #10
M14	Switch	44376	Output #11
M15	Switch	44376	Output #12
M16	Switch	7925	High Power-Normal
M17	Fuse	3863	2 Amp. AGC
M18	Fuse	10707	3 Amp. AGC
	Knob	55229	

HIGH-LOW POWER SWITCH

A toggle switch marked H. P.-NOR is mounted on the top of the chassis near the rear panel. It is locked in the high power (H. P.) position. For longer tube life with a slight loss in output power, remove the switch-locking bracket and put the switch in the NOR position. Re-install the bracket.

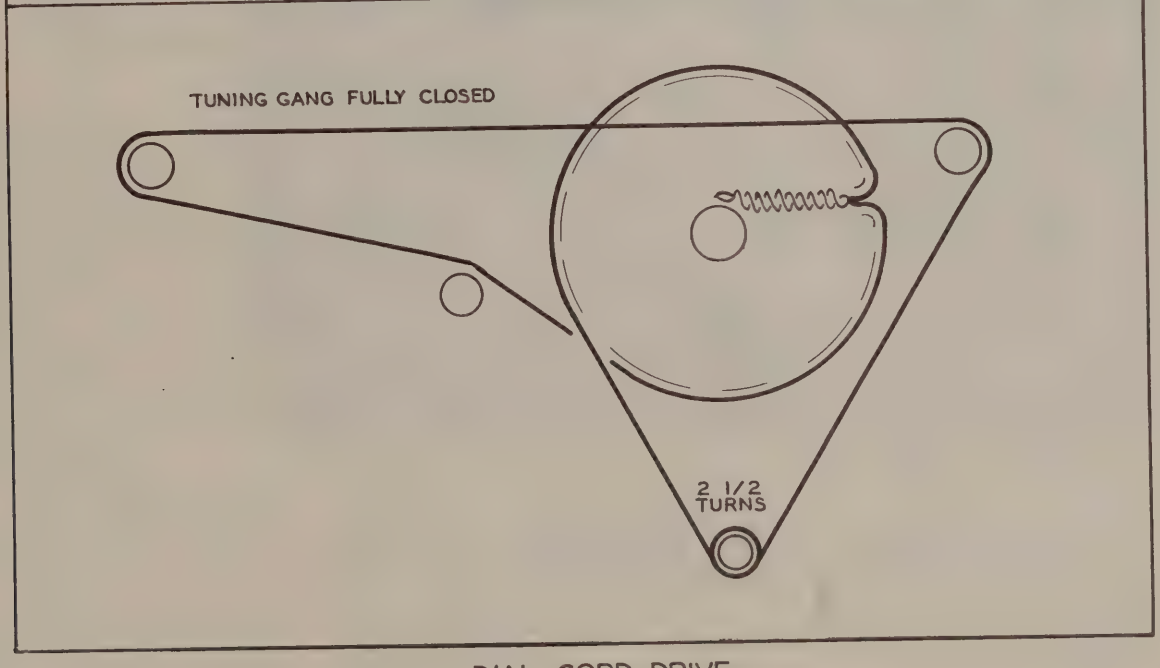
CAUTION: Do not operate the amplifier with this switch in the H. P. position if the normal a-c supply voltage is over 120 volts (or 240 volts).



RECORDIO
MODELS 9G40M, 9G42

RECORDIO MODEL 9G40M

TRADE NAME	Recordio, Models 9G40M, 9G42		
MANUFACTURER	Wilcox-Gay Corp., Charlotte, Michigan		
TYPE SET	AC Operated Combination Phonograph-Recorder-Radio, AM-FM Superheterodyne Receiver		
TUBES(SEVEN)	Types 12AT7 Converter, 6BA6 1st IF Amp., 6AU6 FM 2nd IF-Mic. Pre-Amp., 6AL5 Ratio Det., 6AT6 DET.-AVC-AF, 6AQ5 Power Output, 5Y3GT Rectifier		
POWER SUPPLY	110-120 Volts AC	RATING	.50 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	FREQ. MOD.	88-109MC



DIAL CORD DRIVE

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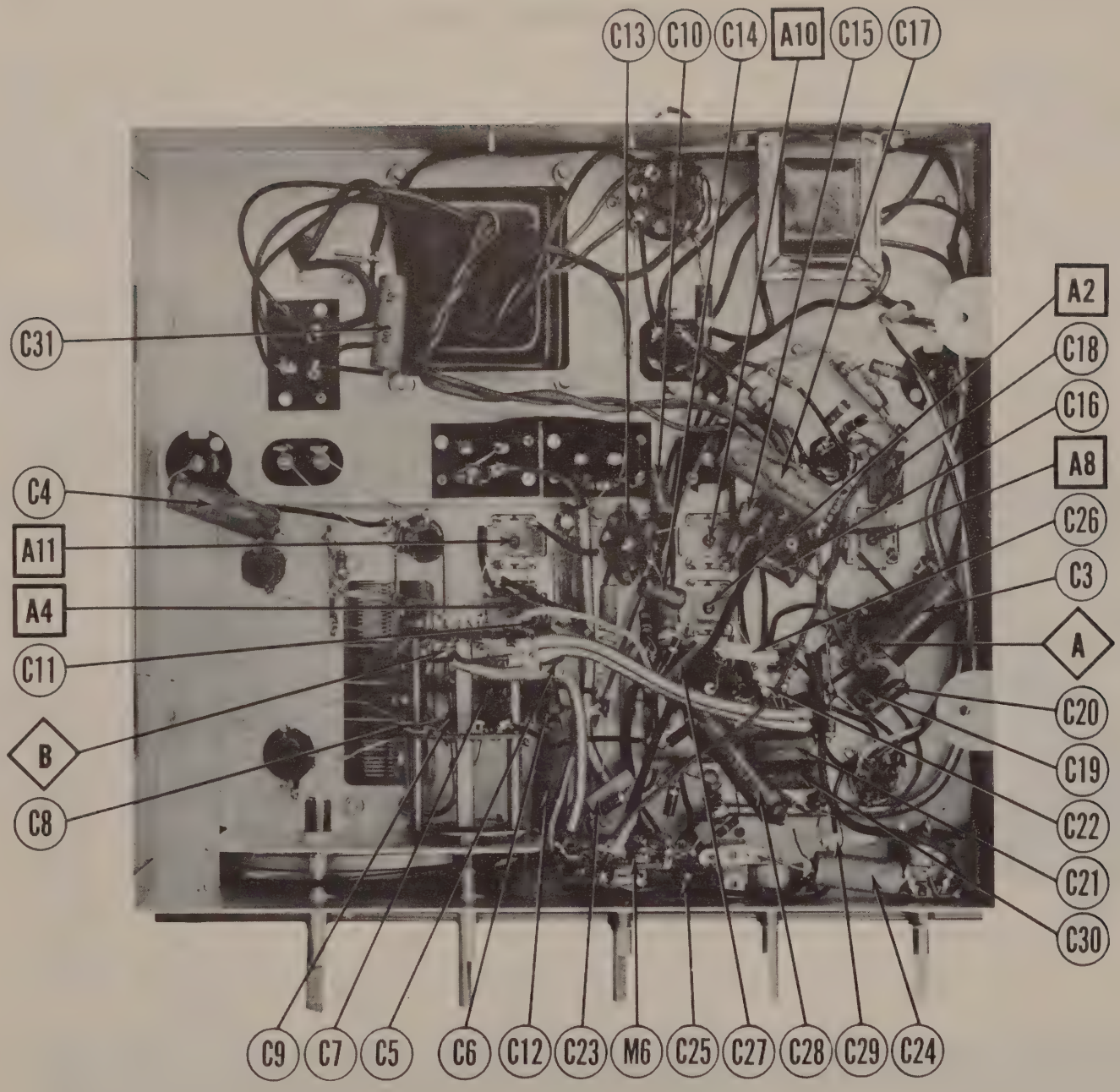
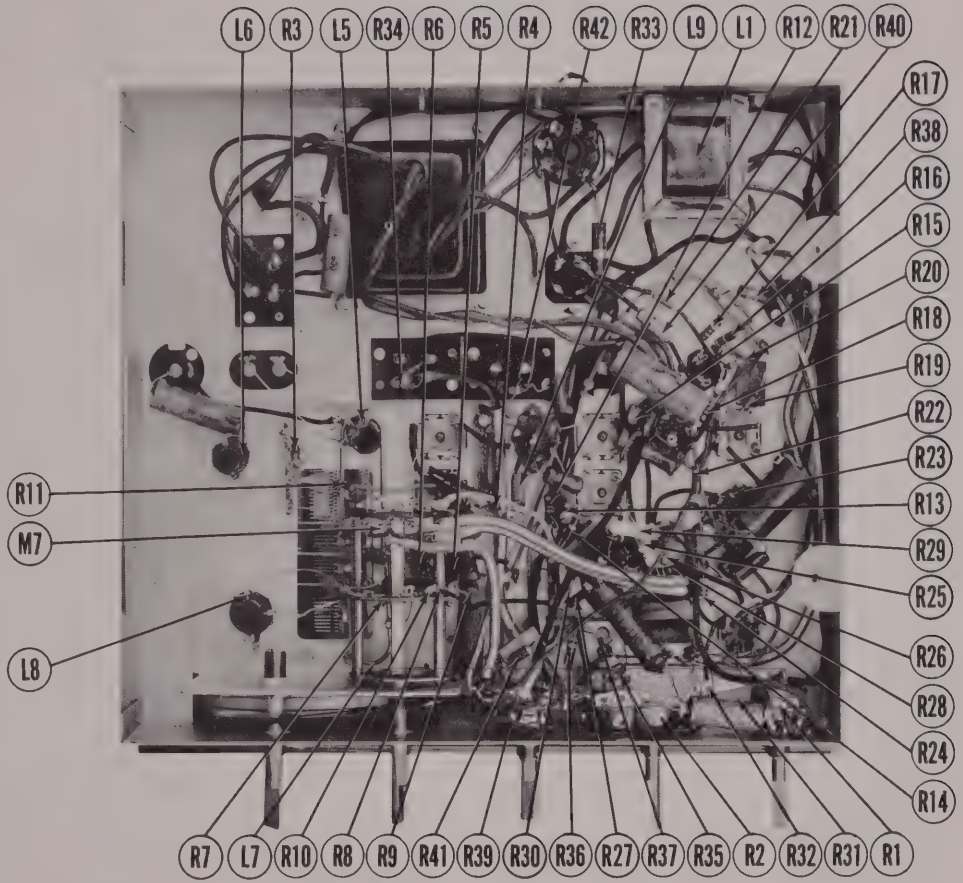

C13
C10
C14
A10
C15
C17
A2
C18
C16
A8
C26
C3
A
C20
C19
C22
C21
C30
C31
C4
A11
A4
C11
B
C8
C9
C7
C5
C6
C12
C23
M6
C25
C27
C28
C29
C24


L6
R3
L5
R34
R6
R5
R4
R42
R33
L9
L1
R12
R21
R40
R17
R38
R16
R15
R20
R18
R19
R22
R23
R13
R29
R25
R26
R28
R24
R14
R11
M7
L8
R7
L7
R10
R8
R9
R41
R39
R30
R36
R27
R37
R35
R2
R32
R31
R1

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the function selector switch to "Radio".

To set dial pointer turn the tuning gang fully closed and set the pointer even with the end of the centerline on the low frequency end of the dial scale.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator on rear section of tuning gang. Low side to chassis.	456KC (400 ~ Mod.)	AM (CCW)	1500KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.05MFD	"	1500KC	"	"	"	A5	"
3.		Loop	1400KC	"	1400KC	"	A6	Replace set in cabinet. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		Loop	600KC	"	600KC	"	A7	Replace set in cabinet. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 3 and 4 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point A to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.05MFD	High side to stator of FM-Ant. section on tuning gang. Low side to chassis.	10.7MC (Unmod.)	FM (CW)	Tuning gang fully open	DC Probe to Point (A) Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection. Attenuate signal generator to maintain reading of less than 5 volts.
6.	.05MFD	"	"	"	"	DC Probe to Point (B) Common to Point (C)	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to stator of FM-Ant. section on tuning gang. Low side to chassis.	10.7MC (450KC Sweep)	FM (CW)	Point of non-interference	Vert. Amp. to Point (A) Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizer capacitor (C3). Adjust for maximum amplitude and symmetry as per Fig 1.
6.	.01MFD	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A13	Reconnect capacitor C3. Adjust A13 so 10.7MC occurs at center of crossover lines as per Fig 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Two 150Ω carbon res.	Across FM antenna terminals with 150Ω in each lead.	100MC (Unmod.)	FM	100MC	DC Probe to Point (A) Common to chassis.	A14, A15	Adjust for maximum deflection. If 2 peaks are noted on A14, use the one with least capacity.

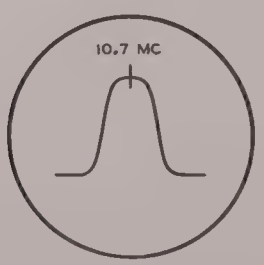


FIG. 1

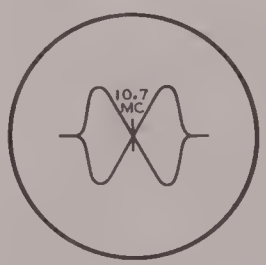


FIG. 2

DISASSEMBLY INSTRUCTIONS

1. Remove five push-on type control knobs.
2. Remove phono motor, pick-up, antenna and speaker plugs from receiver chassis.
3. Remove two wire nuts and disconnect phono compartment light wires at splices.
4. Remove two antenna terminal screws on receiver chassis and remove built-in FM antenna leads.
5. Remove four phillips head screws holding receiver chassis. Remove chassis.
6. Remove four 5/16" hex nuts holding speaker. Remove speaker.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RECORDIO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12AT7	12AT7	9A	
V2	1st IF Amp.	6BA6	6BA6	7BK	
V3	FM 2nd IF Amp. Mic. Pre Amp.	6AU6	6AU8	7BK	
V4	Ratio Det.	6AL5	6AL5	6BT	
V5	DET.-AVC-AF	6AT6	6AT6	7BT	
V6	Power Output	6AQ5	6AQ5	7BZ	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RECORDIO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	12	450	18-2039	AF444J4A	UP1145C		EL-431	▲ Filter
B	12	450						■ Filter
C	30	25						▲ Output Cathode Bypass
C2A	10	400	18-2040	AF22J4A	UP1145C		EL-202	■ 2nd IF Decoupling
B	10	400						▲ Decoupling 2nd IF Cathode Bypass
C3	2	150	18-2059	PRS150/4	BR415		UT-41	Stabilizing Cap.
C4	.05	400		P488-05	PTE4S5		TM-15	RF Coupling
C5	20			1468-000025	5W5Q2	GP1K-22	MS-42	Conv. Cathode Bypass
C6	10000			P488-01	PTE4S1	821-01	36C1	Conv. Cathode Bypass
C7	50			1468-00005	5W5Q5	GP1K-50	1FM-45	Conv. Cathode Bypass
C8	50			1468-00005	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
R9	470	500		1468-0005	5W5T5	GP2K-470	1FM-35	Osc. Feedback
R10	10000			P488-01	PTE4S1	821-01	36C1	Filament Bypass
R11	10000			P488-01	PTE4S1	821-01	36C1	Conv. Plate Decoupling
R12	.1	200		P288-1	PTE4P1		TM-1	AVC Filter
R13	10000			P488-01	PTE4S1	821-01	36C1	1st IF Screen Bypass
R14	10000			P488-01	PTE4S1	821-01	36C1	1st IF Plate Decoupling
R15	220	500		1468-00025	5W5T25	GP2K-220	1FM-325	2nd IF Grid Filter
R16	10000			P488-01	PTE4S1	821-01	36C1	2nd IF Cath. Bypass
R17	.1	400		P488-1	PTE4P1		TM-1	2nd IF Screen Bypass
R18	500	500		1468-0005	5W5T5	GP2K-500	1FM-35	2nd IF Plate Decoupling
R19	82	500		1468-0001	5W5T1	GP1K-100	1FM-31	Diode Load Cap. See Note 4
R20	82	500		1468-0001	5W5T1	GP1K-100	1FM-31	Diode Load Cap. See Note 4
R21	1600	500		1467-0015	IW5D15	GP2L-0015	1FM-215	De-emphasis
R22A	100			1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter See Note 1
B	50			1468-0005	5W5Q5	GP1K-50	1FM-45	Diode RF Filter See Note 1
R23	330	500		1468-00035	5W5T3	GP2K-330	1FM-335	Tone Compensation
R24	.02	400		P488-02	PTE4S2		TM-12	Audio Coupling
R25	.02	400		P488-02	PTE4S2		TM-12	Tone Compensation
R26	10000			P488-01	PTE4S1	821-01	TM-11	Audio Coupling See Note 2
R27	100			1468-0001	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Bypass
R28	.01	600		P688-01	PTE6S1	821-01	TM-11	Tone Compensation
R29	10000			P488-01	PTE4S1	821-01	TM-11	Audio Coupling See Note 3
R30	.003	600		P688-003	PTE6D3	GP2M-003	TM-23	Tone Compensation
R31	.01	600		P688-01	PTE6S1	821-01	TM-11	Line Filter

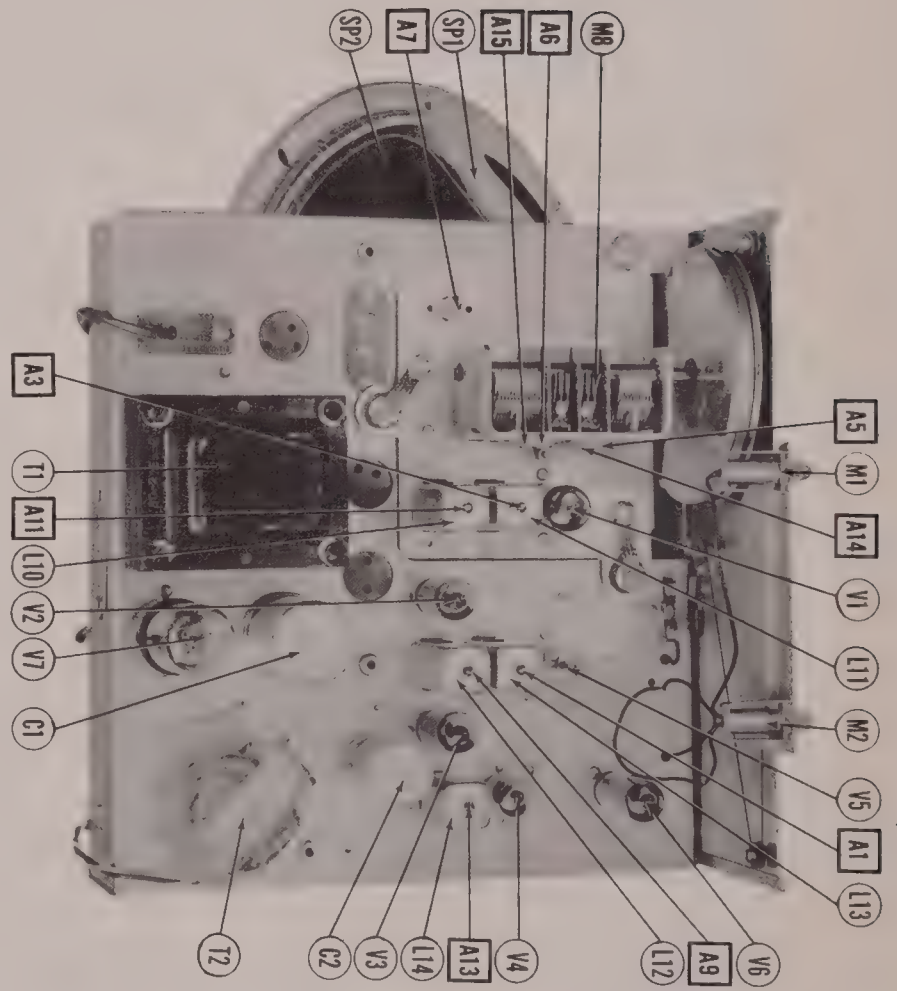
Note 1. Items C22A, C22B and R25 are combined into one unit.
Note 2. Items C26 and R 29 are combined into one unit.
Note 3. Items C29 and R32 are combined into one unit.
Note 4. When either item C19 or C20 are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RECORDIO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2		Q13-133X	T-78	Volume control, tapped at 150KΩ
B	Switch			76-1	SW-A	Attach to R1A per instructions
R2	1 Meg.	1/2		Q13-137	M-63-Z	Tone control

SET 86
FOLDER 9

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RECORDIO PART No.	IRC PART No.	
R3	1 Meg.	½		BTS-1 Meg.	AVC Network
R4	1000Ω	½		BTS-1000	Conv. Plate Decoupling
R5	2200Ω	½		BTS-2200	Conv. Cathode
R6	2200Ω	½		BTS-2200	Conv. Cathode
R7	22KΩ	½		BTS-22K	Osc. Grid
R8	47KΩ	½		BTS-47K	Osc. Plate
R9	4700Ω	1		BTA-4700	Osc. Plate
R10	10Ω	½			Parasitic Supp.
R11	1 Meg.	½		BTS-1 Meg.	AVC Network
R12	68Ω	½			1st IF Cathode
R13	39KΩ	1		BTA-39K	1st IF Screen
R14	1000Ω	½		BTS-1000	1st IF Plate Decoupling
R15	1 Meg.	½		BTS-1 Meg.	Mic. Pre Amp. Grid
R16	390Ω	½		BW-½-390	Mic. Pre. Amp. Cathode
R17	150Ω	½			2nd FM IF Cathode
R18	47KΩ	½		BTS-47K	2nd FM IF Screen
R19	10KΩ	½		BTS-10K	2nd FM IF Plate Decoupling
R20	27KΩ	½		BTS-27K	Mic. Pre Amp.
R21	33KΩ	½		BTS-33K	Decoupling
R22	33Ω	½			Balancing
R23	15KΩ	½		BTS-15K	Ratio Det. Diode Load
R24	47KΩ	½		BTS-47K	De-emphasis
R25	47KΩ	½		BTS-47K	Diode Filter See Note 1
R26	470KΩ	½		BTS-470K	Diode Load
R27	10 Meg.	½		BTS-10 Meg.	Delayed AVC
R28	270KΩ	½		BTS-270K	AVC Network
R29	10 Meg.	½		BTS-10 Meg.	AF Grid See Note 2
R30	220KΩ	½		BTS-220K	AF Plate
R31	22KΩ	½		BTS-22K	Tone Compensation
R32	500KΩ	½		BTS-470K	Output Grid See Note 3
R33	330Ω	1		BTA-330	Output Cathode
R34	56KΩ	½		BTS-56K	Tone Compensation
R35	56KΩ	½		BTS-56K	Tone Compensation
R36	1 Meg.	½		BTS-1 Meg.	Series Neon Lamp
R37	820KΩ	½		BTS-820K	Neon Lamp Shunt
R38	1.5Ω	½		BW-½-1.5	Voice Coil Shunt Wire Wound
R39	1.8Ω	½		BW-½-1.8	Voice Coil Shunt Wire Wound
R40	6800Ω	1		BTA-6800	Filter
R41	1.5 Meg.	½		BTS-1.5 Meg.	Tone Compensation
R42	1 Meg.	½		BTS-1 Meg.	Tone Compensation

Note 1. Items C22A, C22B and R25 are combined into one unit.
Note 2. Items C26, and R29 are combined into one unit.
Note 3. Items C29 and R32 are combined into one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	RECORDIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at .50A	600VCT .064ADC	5VAC at 2A	6.3VAC at 2.3A	80-2168-2			PH-70

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				
	IMPEDANCE		DC RES.		RECORDIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
	PRI.	SEC.	PRI.	SEC. 1					
T2	5.7KΩ	3.5Ω	730Ω	.4Ω	81-2093				
				SEC. 2 3.5KΩ					

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			RECORDIO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-101 †		
SP1	PM	3.3Ω		MOD. P12-T	12A4A	† Shunt voice coil with 8Ω resistor.
	CONE DIA.	V. C. DIA.				
SP2	11 1/2"	1"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	RECORDIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.064A	380Ω	10 Henries	14-2097	C-1723	C-2990 †	R-650 †	† Drill one new mounting hole.

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	RECORDIO PART No.	MEISSNER PART No.	
L2	AM Ant.	0Ω				300Ω line around cabinet.
L3	FM Ant.	0Ω				300Ω line in cabinet.
L4	AM Ant. Loading	1.5Ω				
L5	FM Ant. Coil	0Ω				
L6	AM Ant. Coil	1.5Ω				
L7	FM Osc. Coil	0Ω				
L8	AM Osc. Coil	.5Ω	3Ω		14-1060	
L9	Fil. Choke	.2Ω				
L10	1st FM IF	1.2Ω	1.2Ω			
L11	1st AM IF	13Ω	13Ω			Tapped at 3Ω
L12	2nd FM IF	1.2Ω	1.2Ω			
L13	2nd AM IF	13Ω	13Ω		16-6678	
L14	Ratio Det. Trans.	2.5Ω	.5Ω			

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RECORDIO PART No.		
M1	Bayonet	6-8	.25	Blue			Type #44
M2	Bayonet	6-8	.25	Blue			Type #44
M3	Bayonet	6-8	.25	Blue			Type #44

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA		REMARKS
	RECORDIO PART No.	ASTATIC PART No.	
M4		LT2-M	Play
M5		X-26	Record

MISCELLANEOUS

ITEM No.	PART NAME	RECORDIO PART No.	NOTES
M6	Switch		Function
M7	Switch		AM-FM
M8	2 Gang Var. Cap.		(17-509MMF, 11-207MMF)

PHOTOFACT* Folder

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4944, 4945 (CH. 3TB10, 24TB10)

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MODEL 4944

SPARTON MODELS
4944, 4945 (CH. 3TB10, 24TB10)

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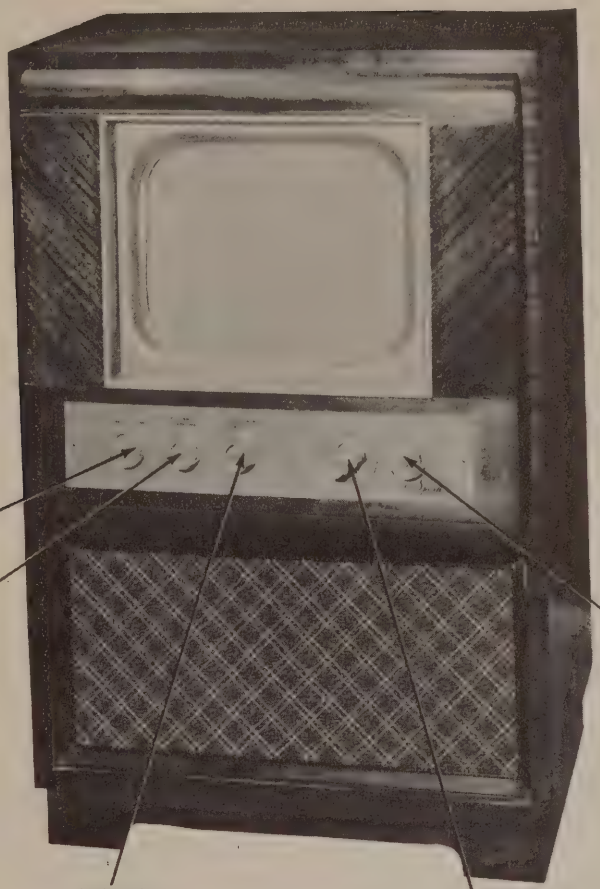
Date 2/50 Set No. 86—Folder No. 10

SPARTON MODELS 4944, 4945 (Ch. 3TB10, 24TB10)



SPARTON MODELS 4944, 4945 (Ch. 3TB10, 24TB10)

SPARTON MODEL 4944

TRADE NAME	Sparton Models 4944, 4945 (TV Chassis 24TB10 and Power Supply Chassis 3TB10)
MANUFACTURER	Sparks-Withington Co., Jackson, Michigan
TYPE SET	Televison Receiver
TUBES	Twenty Eight
POWER SUPPLY	110-120 Volts AC
RATING	1.98 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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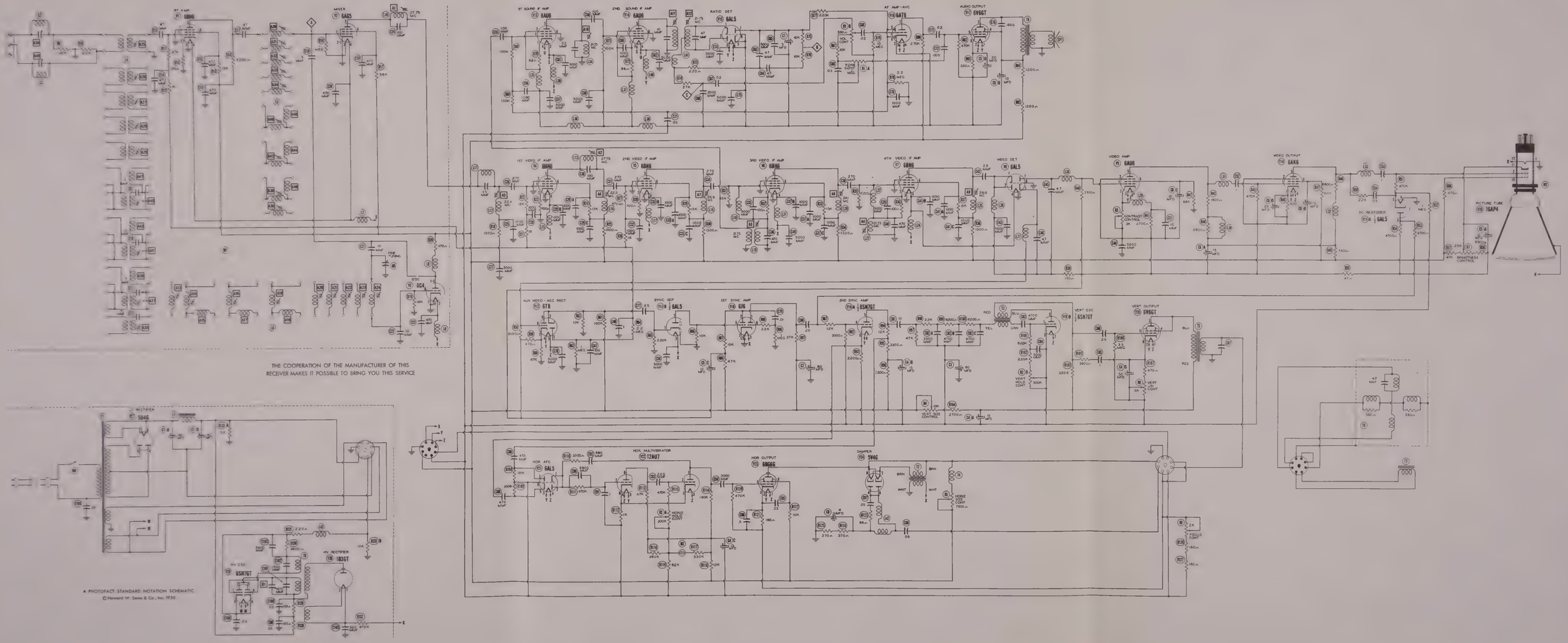

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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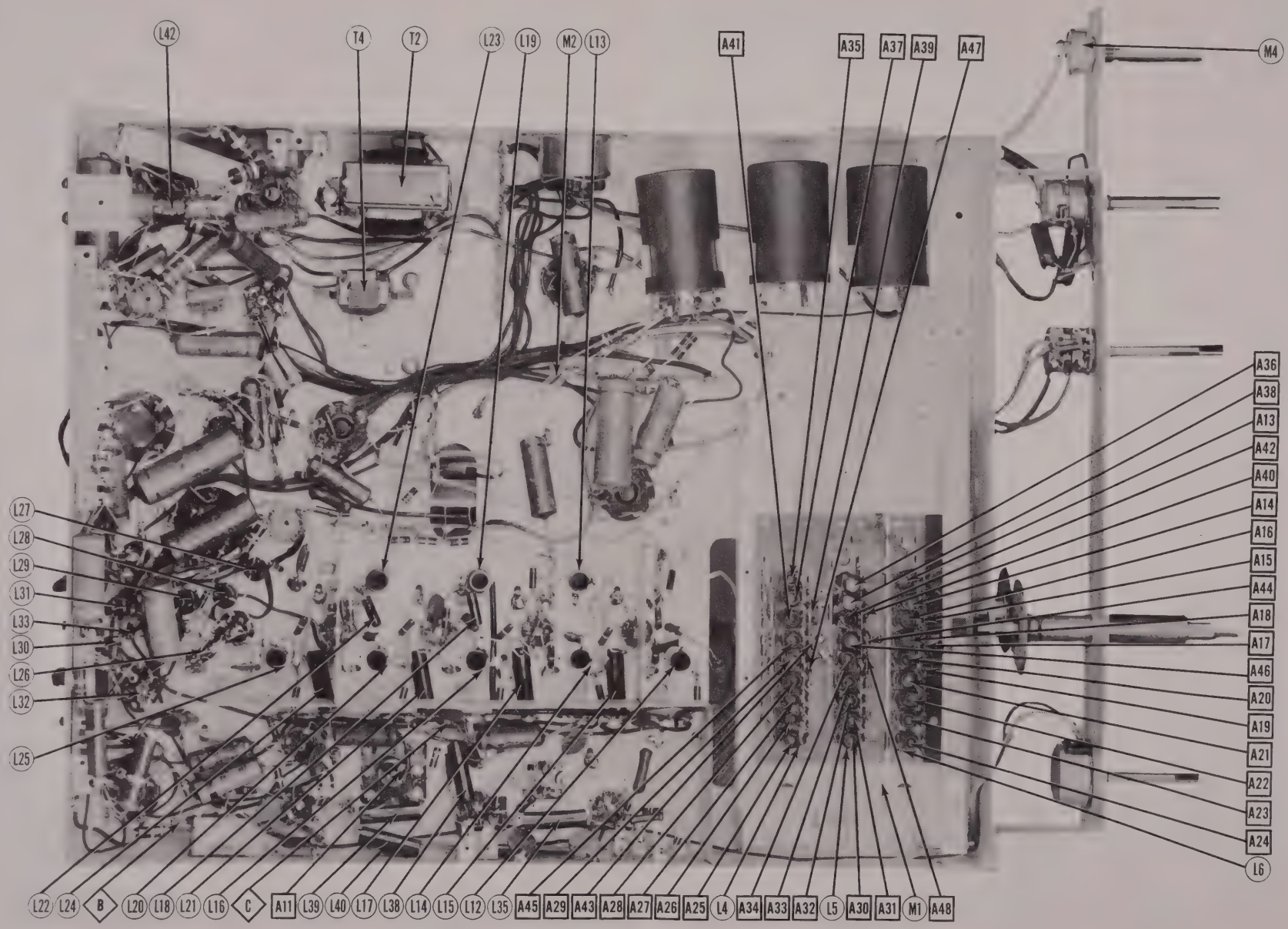
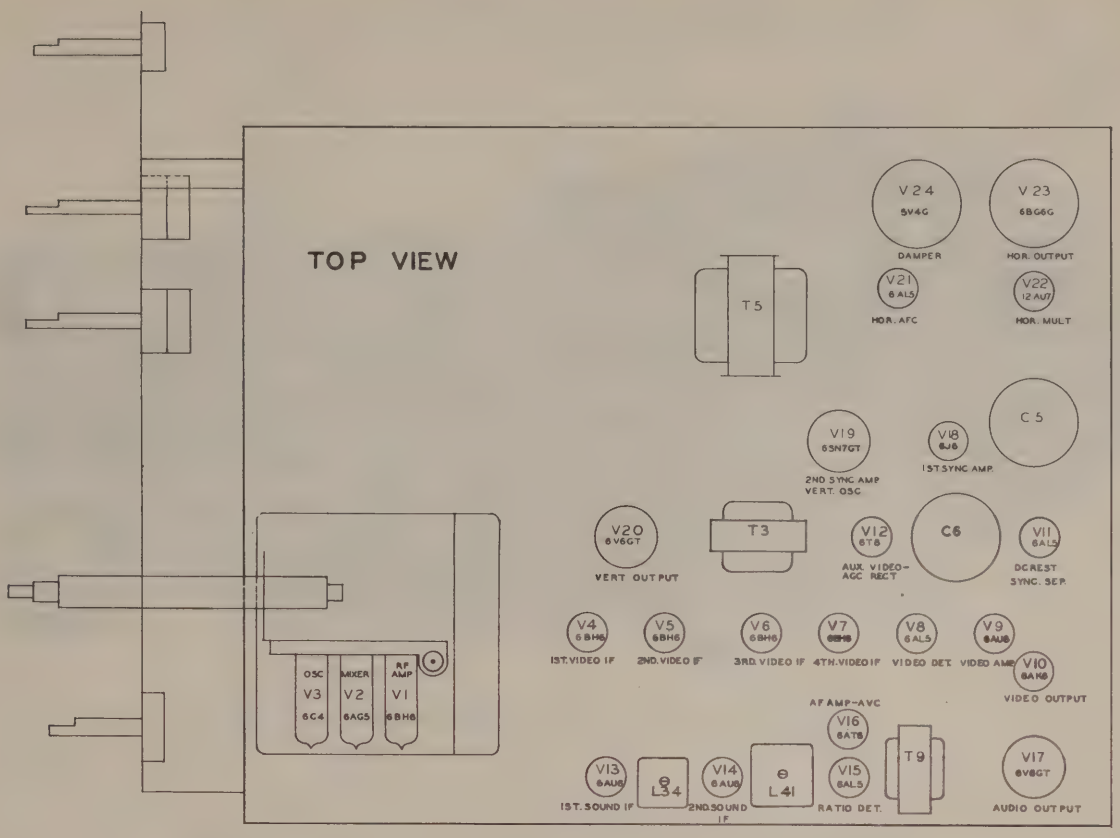
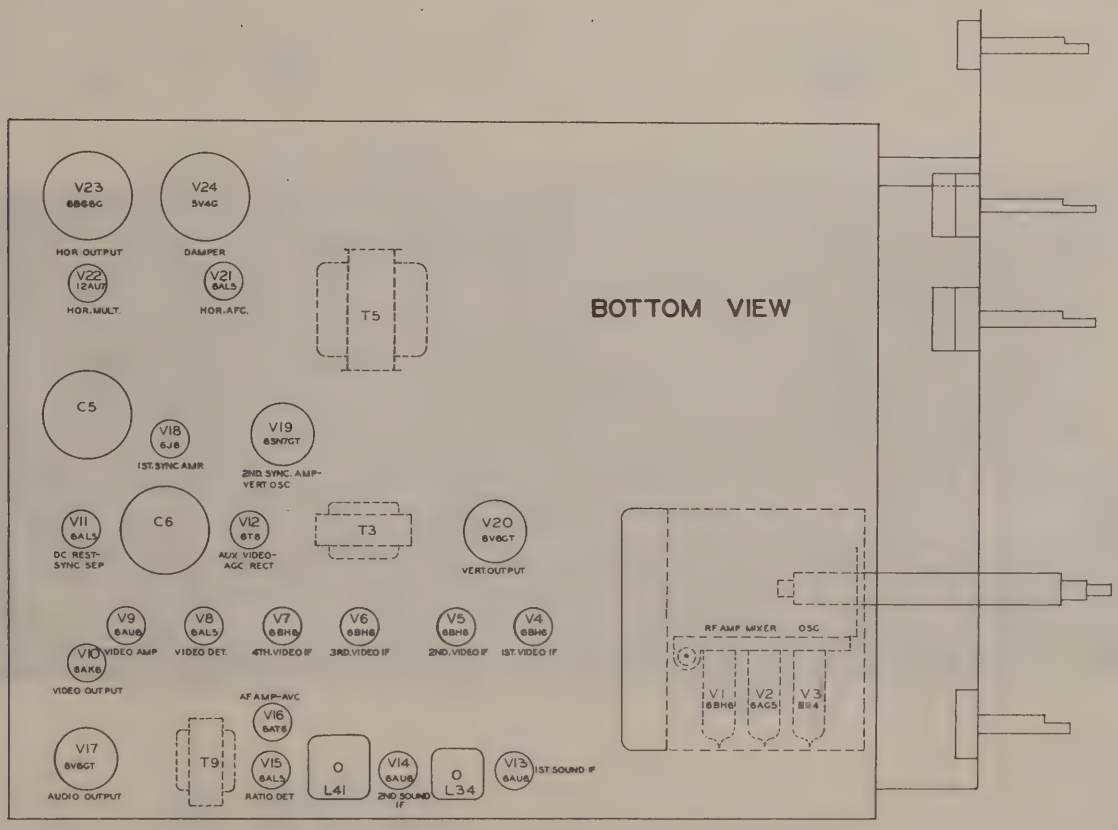
CHASSIS TOP VIEW

SPARTON MODELS 4944, 4945 (Ch. 3TB10, 24TB10)

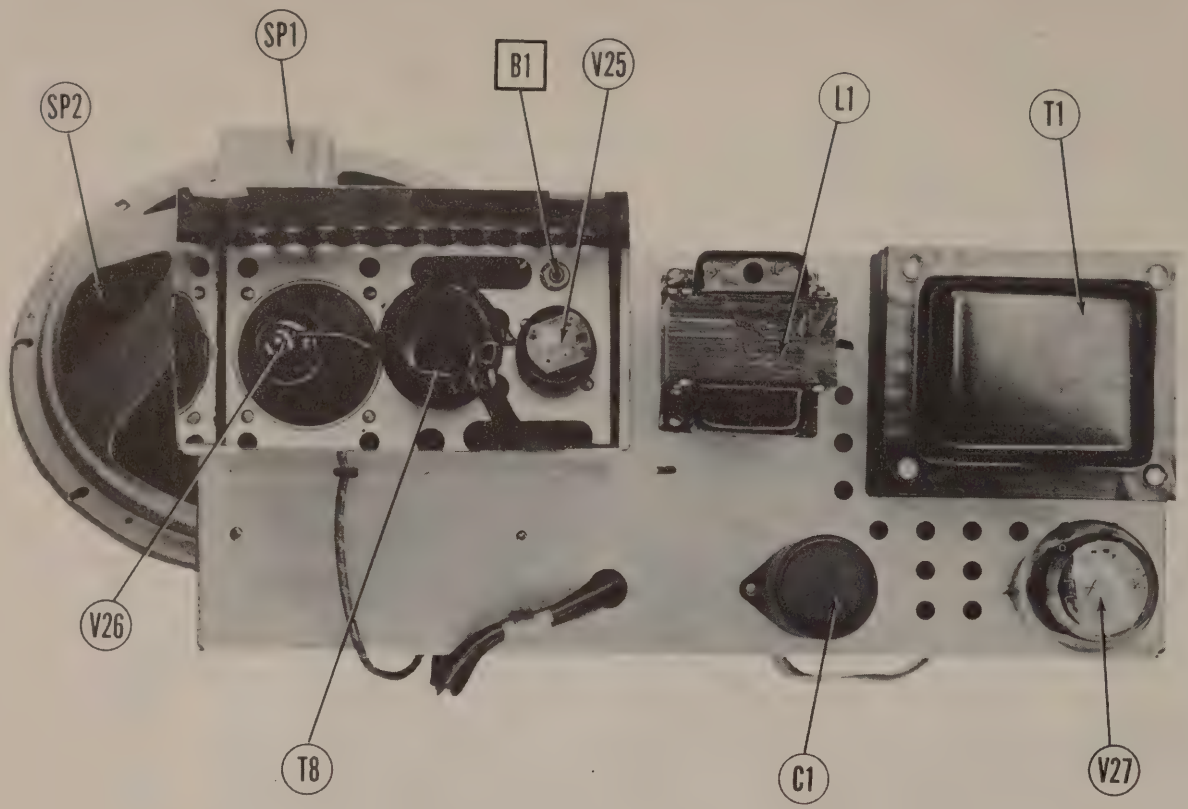


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

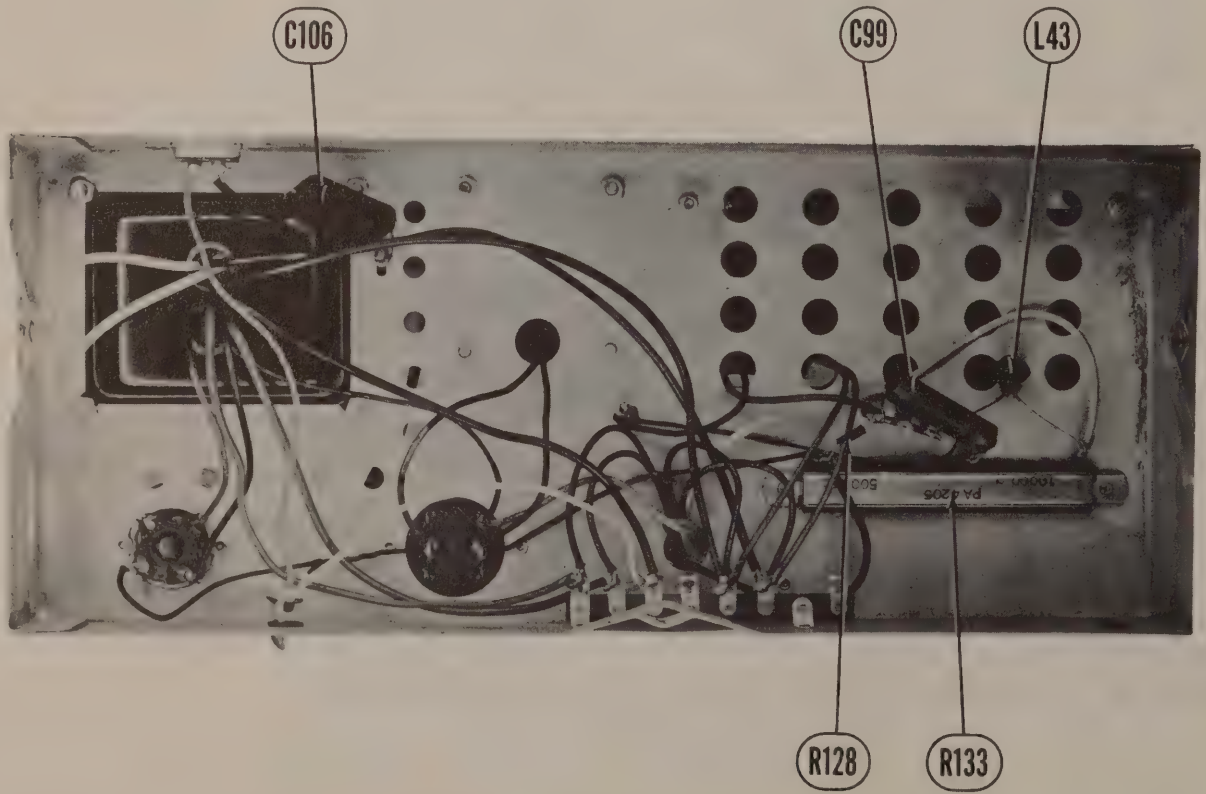




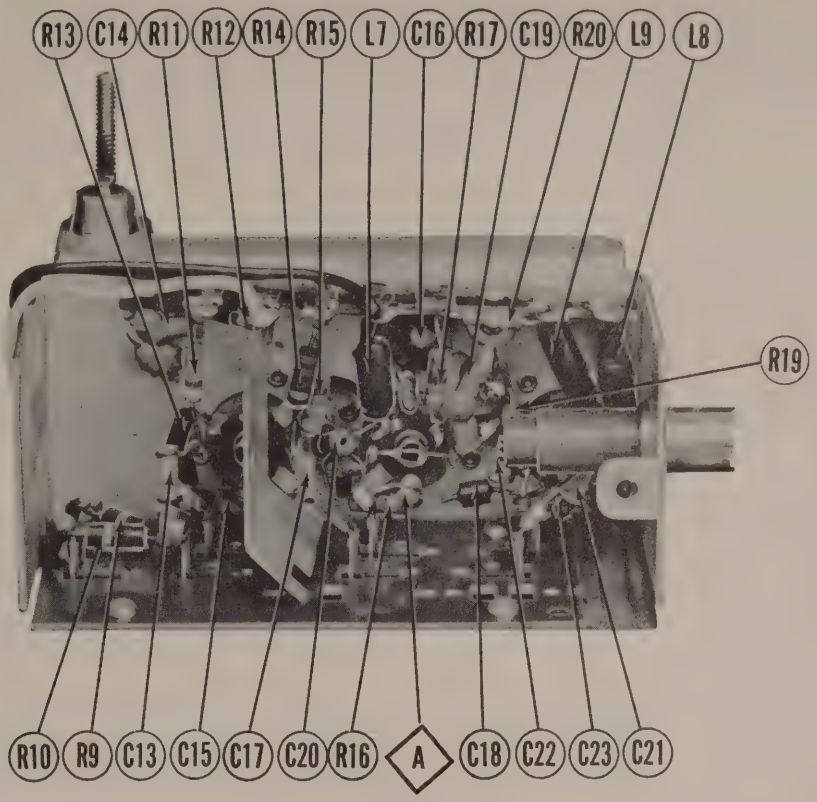
TUBE PLACEMENT CHART



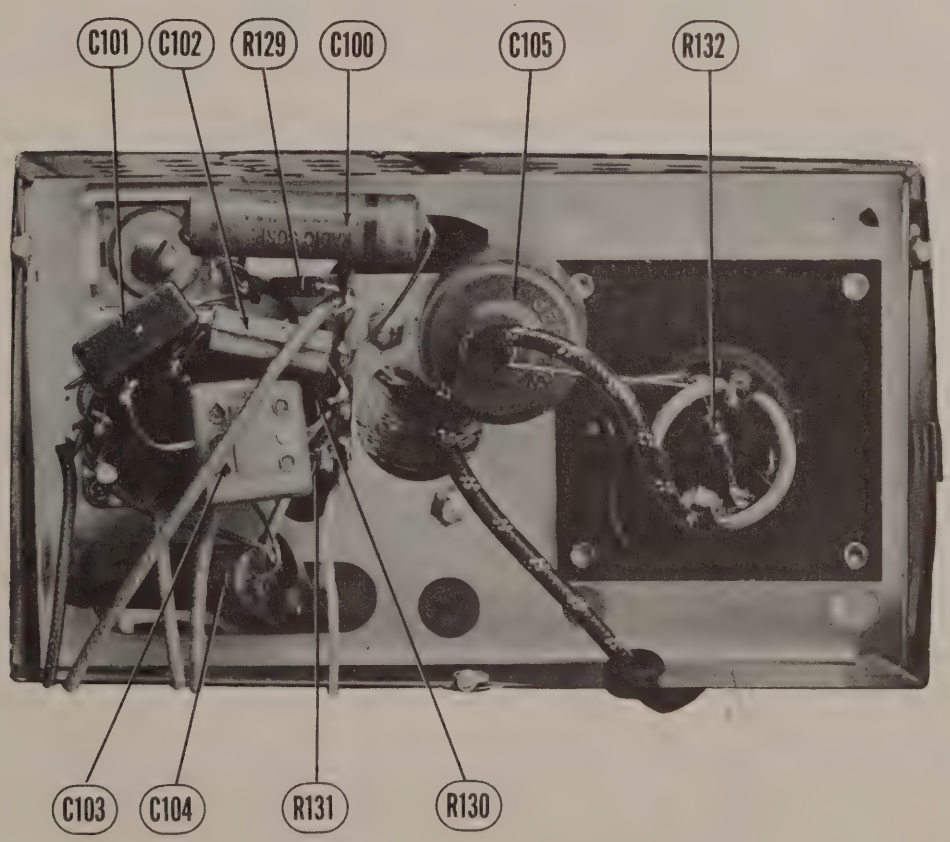
POWER SUPPLY CHASSIS-TOP VIEW



POWER SUPPLY CHASSIS-BOTTOM VIEW



RF TUNER



HIGH VOLTAGE SUPPLY - BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Before starting the alignment of this receiver, pre-set the controls as follows:
Picture Control to center position, Brightness Control to position where raster is visible,
Focus Control to position where focus is obtained, Vertical Hold to center position,
Vertical Linearity center position, Vertical Size to normal raster height, Horizontal Hold center position,
Horizontal Size, to normal raster width.

If the video IF channel is badly out of alignment and oscillating, it is recommended to pre-set the adjustments as follows to stop the oscillations.

"A" Adjustments	Slug Position
A1	Out
A2	Out
A3	In
A4	In
A5	In
A6	In
A7	Out
A8	Out
A9	Out

Remove the RF Amp. tube V1 and the oscillator tube V3 and connect the signal generator to Point A thru the input adapter shown in Fig 1 keeping all leads as short as possible.

Also connect a 3 volt bias battery to the AGC buss. Negative to AGC line-positive to chassis.

CAUTION: If the common lead of the VTVM being used is grounded to the meter case it is necessary to insulate the meter case from the receiver chassis. If not, the -149 V bias line will be shorted out.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	See Pre-align-ment Instr.	High side thru input adaptor to point A. Low side to chassis.	27.75MC	2	Across resistor R40	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	21.75MC	"	"	A3, A4	"
3.	"	"	22.4MC	"	"	A5	Adjust for maximum deflection.
4.	"	"	22.5MC	"	"	A6	"
5.	"	"	25.9MC	"	"	A7	Adjust for maximum deflection. If when making this adjustment, the IF strip should start oscillating, turn A7 to point where oscillation ceases. Adjust A8 and A9 at their proper frequencies and then re-align A7.
6.	"	"	24.1MC	"	"	A8	Adjust for maximum deflection.
7.	"	"	26.0MC	"	"	A9	Adjust for maximum deflection. If overall IF response check is not being made, continue with step 9.

OVERALL VIDEO IF RESPONSE CHECK

Connect the oscilloscope as shown in Fig 2. The filter circuit of two capacitors makes possible the grounding of the oscilloscope to the receiver chassis without shorting out the -140 volt bias supply.

Small ripples may occur on pattern which is due to feedback from the horizontal oscillator circuit. However, never remove the horizontal oscillator tube (V22) or the damper tube (V24) as the removal of either of these tubes will result in excessive plate current in V23 (Horizontal output tube) and will eventually burn out R5 (Horizontal size control).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.		High side thru input filter of Fig. 1 to Point A. Low side to chassis.	24MC (10MC Sweep)	21.75MC 22.7MC 25.5MC 26.5MC 27.75MC	2	See instructions above	A1 thru A9	Observe pattern obtained to see that markers appear at proper points as per Fig 3. Slight readjustments may be necessary to obtain the proper pattern.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	See Pre-align-ment Instr.	High side thru input adaptor to Point A. Low side to chassis.	21.75MC	2	Across capacitor C7	A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC Probe to Point C Common to Point B	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. If A12 required much adjustment, A11 should be retouched for maximum.

OSCILLATOR ALIGNMENT

It is necessary that the sound IF system be accurately aligned before attempting alignment of the oscillator circuits.

Since small inductances are connected in series with the tuned circuits for channels 8, 10, and 12 to form the tuned circuits for channels 7, 9 and 11, the order of alignment is important. It is necessary to align the higher channel of each pair (7 and 8, 9 and 10, 11 and 12) first.

Insert V1 and V3 in the tuner which were removed for the Video and sound IF alignment and set the fine tuning control to the midpoint of its rotation.

The coils slugs are held in place with wax which must be removed when aligning the individual coil and should be replaced after alignment is completed.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 125Ω carbon res.	Insert 125Ω resistor in each lead and connect to antenna terminals.	215.75MC	13	DC Probe to Point C Common to Point B	A13	Adjust for ZERO reading.
12.	"	"	209.75MC	12	"	A14	"
13.	"	"	203.75MC	11	"	A15	Mechanically distort coil position for ZERO reading.
14.	"	"	197.75MC	10	"	A16	Adjust for zero reading.
15.	"	"	191.75MC	9	"	A17	Mechanically distort coil position for zero reading.
16.	"	"	185.75MC	8	"	A18	Adjust for zero reading.
17.	"	"	179.75MC	7	"	A19	Mechanically distort coil position for zero reading.
18.	"	"	87.75MC	6	"	A20	Adjust for zero reading.
19.	"	"	81.75MC	5	"	A21	Adjust for zero reading.
20.	"	"	71.75MC	4	"	A22	Adjust for zero reading.
21.	"	"	65.75MC	3	"	A23	Adjust for zero reading.
22.	"	"	59.75MC	2	"	A24	Adjust for zero reading.

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

In the event complete alignment of the RF Amp. and Mixer circuits is necessary, it is recommended that the complete tuner be returned to the factory for a replacement unit. If only one or two channels require adjustments, alignment for those channels may be performed.
Short the AGC line to chassis while aligning the RF circuits.
Keep signal generator output as low as possible and still give reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
23.	One 50Ω carbon res. & (2)125Ω carbon res.	Shunt generator with 50Ω resistor and insert 125Ω resistor in each lead. Connect across antenna terminal.	59.75MC	2	DC Probe to Point C Common to Point B		Adjust fine tuning control for zero reading.
24.	"	"	"	2	Across cap. C7	A25	Adjust for maximum deflection.
25.	"	"	65.75MC	3	DC Probe to Point C Common to Point B		Adjust fine tuning control for zero reading.
26.	"	"	"	3	Across cap C7	A26	Adjust for maximum deflection.
27.	"	"	71.75MC	4	DC Probe to Point C Common to Point B		Adjust fine tuning control for zero reading.
28.	"	"	"	4	Across cap. C7	A27	Adjust for maximum deflection.
29.	"	"	81.75MC	5	DC Probe to Point C Common to Point B		Adjust fine tuning control for zero reading.
30.	"	"	"	5	Across cap. C7	A28	Adjust for maximum deflection.
31.	"	"	87.75MC	6	DC Probe to Point C Common to Point B		Adjust fine tuning control for zero reading.
32.	"	"	"	6	Across cap. C7	A29	Adjust for maximum deflection.
33.	"	"	55.25MC	2	Across Res. R40	A30	Adjust fine tuning control and A30 for maximum deflection.
34.	"	"	61.25MC	3	"	A31	Adjust fine tuning control and A31 for maximum deflection.
35.	"	"	67.25MC	4	"	A32	Adjust fine tuning control and A32 for maximum deflection.
36.	"	"	77.25MC	5	"	A33	Adjust fine tuning control and A33 for maximum deflection.
37.	"	"	83.25MC	6	"	A34	Adjust for fine tuning control and A34 for maximum deflection.
38.	"	"	213MC	13	"	A35, A36	Adjust fine tuning control and A35 and A36 for maximum deflection.
39.	"	"	207MC	12	"	A37, A38	Adjust fine tuning control A37, and A38 for maximum deflection.
40.	"	"	201MC	11	"	A39, A40	Adjust fine tuning control and mechanically distort A39 and A40 for maximum deflection.
41.	"	"	195MC	10	"	A41, A42	Adjust fine tuning control A41 and A42 for maximum deflection.
42.	"	"	189MC	9	"	A43, A44	Adjust fine tuning control and mechanically distort A43 and A44 for maximum deflection.
43.	"	"	183MC	8	"	A45, A46	Adjust fine tuning control A45 and A46 for maximum deflection.
44.	"	"	177MC	7	"	A47, A48	Adjust fine tuning control and mechanically distort A47 and A48 for maximum deflection.

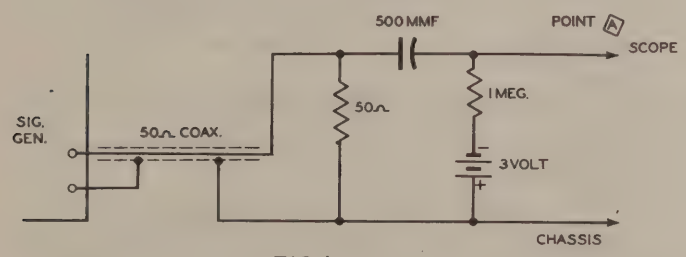


FIG. 1

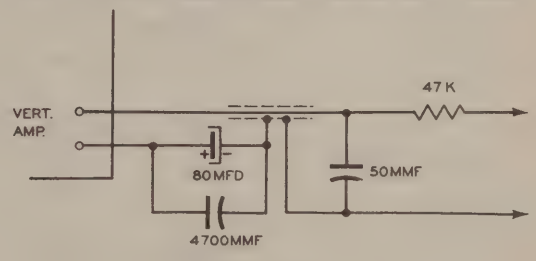


FIG. 2

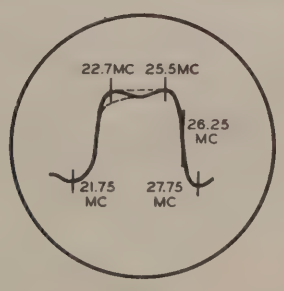


FIG. 3

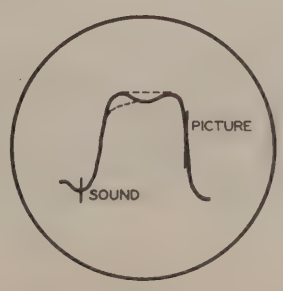


FIG. 4

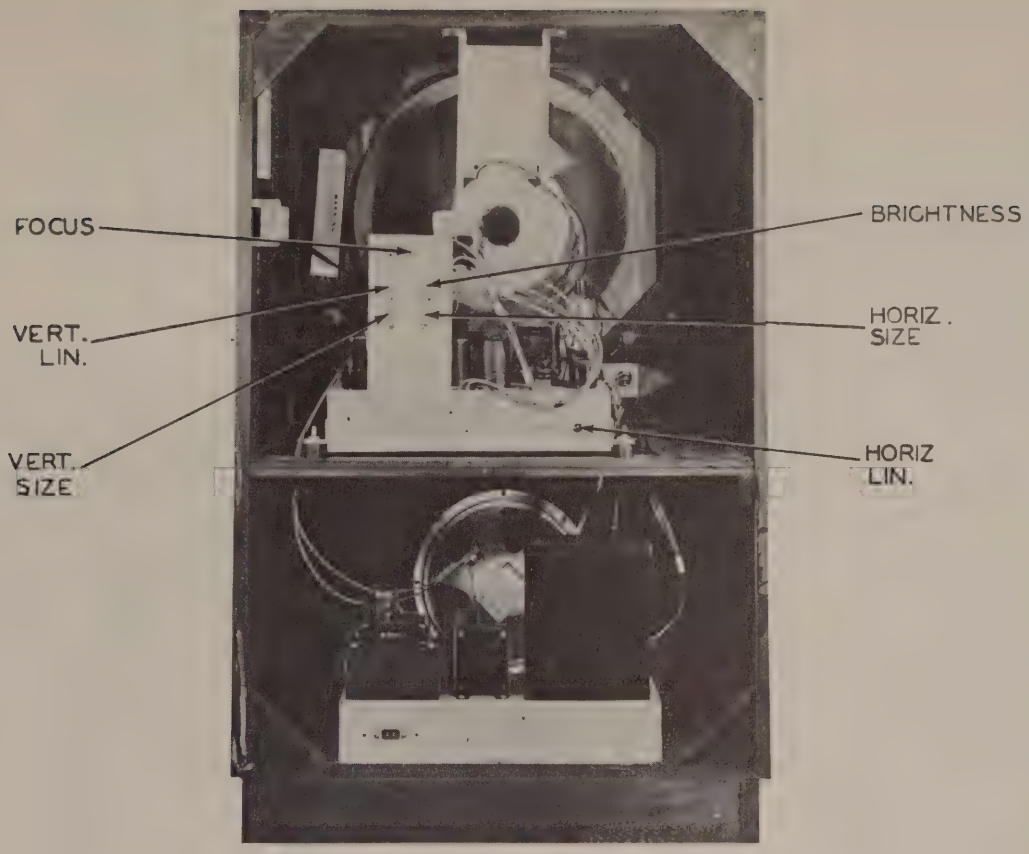
ALIGNMENT INSTRUCTIONS (CONT.)

RF RESPONSE CHECK

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE & VTVM	ADJUST	REMARKS
45.	One 50Ω carbon res. & two 125Ω carbon res.	Shunt generator with 50Ω resistor and insert 125Ω resistor in each lead. Connect across antenna terminals.	Off	215.75MC	13	VTVM DC Probe to Point (C) Common lead to Point (B)		Adjust fine tuning control for zero reading.
46.	"	"	213MC (10MC Sweep)	215.75MC 211.25MC	13	Scope across R40 as per Fig 2.	A35, A36	If necessary, make slight adjustments to properly place markers as per Fig 4.
47,	"	"	Off	209.75MC	12	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
48.	"	"	207MC (10MC SWP)	209.75MC 205.25MC	12	Scope across R40 as per Fig 2.	A37, A38	If necessary, make slight adjustments to properly place markers as per Fig 4.
49.	"	"	Off	203.75MC	11	VTVM DC Probe to point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
50.	"	"	201MC (10MC SWP)	203.75MC 199.25MC	11	Scope across R40 as per Fig 2.	A39, A40	If necessary, mechanically distort the shape and position of coils A39, and A40 to properly place markers as per Fig 4.
51.	"	"	Off	197.75MC	10	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
52.	"	"	195MC (10MC SWP)	197.75MC 193.25MC	10	Scope across R40 as per Fig 2.	A41, A42	If necessary, make slight adjustments to properly place markers as per Fig 4.
53.	"	"	Off	191.75MC	9	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
54.	"	"	189MC (10MC SWP)	191.75MC 187.25MC	9	Scope across R40 as per Fig 2.	A43, A44	If necessary, mechanically distort the shape and position of coils A43, and A44 to properly place markers as per Fig 4.
55.	"	"	Off	185.75MC	8	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
56.	"	"	183MC (10MC SWP)	185.75MC 181.25MC	8	Scope across R40 as per Fig 2.	A45, A46	If necessary, make slight adjustments to properly place markers as per Fig 4.
57.	"	"	Off	179.75MC	7	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
58.	"	"	177MC (10MC SWP)	179.75MC 175.25MC	7	Scope across AR40 as per Fig 2.	A47, A48	If necessary, mechanically distort the shape and position of coils A47 and A48 to properly place markers as per Fig 4.
59.	"	"	Off	87.75MC	6	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
60.	"	"	85MC (10MC SWP)	87.75MC 83.25MC	6	Scope across R40 as per Fig 2.	A29, A34	If necessary, make slight adjustments to properly place markers as per Fig 4.
61.	"	"	Off	81.75MC	5	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
62.	"	"	79MC (10MC SWP)	81.75MC 77.25MC	5	Scope across R40 as per Fig 2.	A28, A33	If necessary, make slight adjustments to properly place markers as per Fig 4.
63.	"	"	Off	71.75MC	4	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
64.	"	"	69MC (10MC SWP)	71.75MC 67.25MC	4	Scope across R40 as per Fig 2.	A27, A32	If necessary, make slight adjustments to properly place markers as per Fig 4.
65.	"	"	Off	65.75MC	3	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
66.	"	"	63MC (10MC SWP)	65.75MC 61.25MC	3	Scope across R40 as per Fig 2.	A26, A31	If necessary, make slight adjustments to properly place markers as per Fig 4.
67.	"	"	Off	59.75MC	2	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
68.	"	"	57MC (10MC SWP)	59.75MC 55.25MC	2	Scope across R40 as per Fig 2.	A25, A30	If necessary, make slight adjustments to properly place markers as per Fig 4.

WAVE TRAP ADJUSTMENT

The sound IF wave traps (A49 and A50), located in the antenna lead are pre-set at the factory and should not require adjustment in the field.
In the event that interference is encountered these traps may be adjusted using the following procedure.
Connect the signal generator, through a matching network of resistors, to the antenna terminals of the receiver. Set the generator to 21.75MC.
Connect a VTVM across C7. Adjust the trap located in the side of the transmission to which the high side of the signal generator is connected for minimum deflection. Reverse the signal generator connections and adjust the remaining trap for minimum deflection. Failure to reverse the generator lead will result in maladjustment of the trap.



CABINET–REAR VIEW

HIGH VOLTAGE RF OSCILLATOR ADJUSTMENT

The high voltage output may be varied by adjustment of trimmer B1 which is located in the high voltage compartment.

This trimmer is adjusted for approximately 10KV on the high capacity side of the high voltage peak.

This setting gives maximum efficiency and regulation.

DISASSEMBLY INSTRUCTIONS

1. Remove five push-on type control knobs.
2. Remove two 1/4" hex head bolts and 3 phillips head screws holding rear cover. Remove cover.
3. Remove speaker plugs.
4. Remove power plug from right side of TV chassis.
5. Disconnect power plug lead to off-on switch.
6. Remove picture tube base socket, HV cap and yoke plug.
7. Remove two 1/4" hex head bolts holding HV lead clamps to TV chassis.
8. Remove two phillips head screws holding antenna terminal strip.
9. Remove two 3/8" hex head bolts and nuts holding TV chassis. Remove chassis.
10. Remove three 3/8" hex head bolts holding power chassis. Remove chassis.
11. Remove four 11/32" hex nuts holding speaker. Remove speaker.
12. Remove picture tube beam bender.
13. Remove four wing nuts holding cabinet front panel. Remove panel.
14. Loosen four screws holding picture tube front supports. Slide supports away from tube. Remove picture tube.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-2VDC	.6VDC	0V.	6.3VAC	165VDC	125VDC	0V.		
V 2	6AG5	-1.4VDC	0V.	0V.	6.3VAC	145VDC	90VDC	0V.		
V 3	6C4	135VDC	0V.	6.3VAC	0V.	135VDC	§-2VDC	0V.		
V 4	6BH6	-1.5VDC	.5VDC	0V.	6.3VAC	165VDC	110VDC	0V.		
V 5	6BH6	-.7VDC	.8VDC	0V.	6.3VAC	165VDC	110VDC	0V.		
V 6	6BH6	0V.	.9VDC	0V.	6.3VAC	165VDC	110VDC	0V.		
V 7	6BH6	0V.	.9VDC	0V.	6.3VAC	165VDC	110VDC	0V.		
V 8	6AL5	#.7VDC	#.7VDC	0V.	6.3VAC	#1.4VDC	0V.	#.3VDC		
V 9	6AU6	#.3VDC	#.7VDC	#6.3VAC	#0V.	#280VDC	#120VDC	#3VDC		
V 10	6AK6	#.2VDC	#.8VDC	#6.3VAC	#0V.	#200VDC	#170VDC	#10VDC		
V 11	6AL5	.8VDC	#0V.	#6.3VAC	#0V.	#2.3VAC	0V.	-.2VDC		
V 12	6T8	0V.	#110VDC	#150VDC	#6.3VAC	#0V.	0V.	#2.7VDC	#1.1VDC	#150VDC
V 13	6AU6	#0V.	#0V.	#0V.	#6.3VAC	#150VDC	#150VDC	#1VDC		
V 14	6AU6	#0V.	#0V.	#0V.	#6.3VAC	#150VDC	#150VDC	#1VDC		
V 15	6AL5	#-.4VDC	#-.4VDC	#6.3VAC	#0V.	#0V.	#0V.	#-.7VDC		
V 16	6AT6	#-.4VDC	#0V.	#6.3VAC	#0V.	#-.1VDC	#-.1VDC	#80VDC		
V 17	6V6GT	#150VDC	#0V.	#205VDC	#220VDC	#0V.	0V.	6.3VAC	#12VDC	
V 18	6J6	90VDC	28VDC	6.3VAC	0V.	-.2VDC	-.6VDC	0V.		
V 19	6SN7GT	#-34VDC	#90VDC #155VDC	#0V.	#0V.	#230VDC	#9VDC	#0V	#6.3VAC	
V 20	6V6GT	0V.	#6.3VAC	#125VDC #215VDC	#125VDC #215VDC	#0V.	#0V.	#0V.	#12VDC #37VDC	
V 21	6AL5	#-.3VDC	#-.3VDC	#6.3VAC	#0V.	#2.5VDC	#0V.	#-2.4VDC		
V 22	12AU7	#95VDC	#-8.7VDC	#4VDC	#0V.	#0V.	#115VDC	#-.3VDC	#4VDC	#6.3VAC
V 23	6BG6G	0V.	#6.3VAC	¶27VDC	¶300VDC	¶-4.8VDC	0V.	#0V.	¶300VDC	TOP CAP *
V 24	5V4G	0V.	*	0V.	-27VDC	-26VDC	-27VDC	0V.	*	
V 25	6SN7GT	#-33VDC	#310VDC	#5.3VDC	#-33VDC	#310VDC	#5.3VDC	#6.3VAC	#0V.	
V 26	1B3GT	* DO NOT MEASURE								
V 27	5U4G	0V.	170VDC	0V.	400VAC	0V.	400VAC	0V.	170VDC	
V 28	16AP4	0V.	#.6VDC	PIN 10 150VDC	PIN 11 #25VDC #110VDC	PIN 12 6.3VAC				

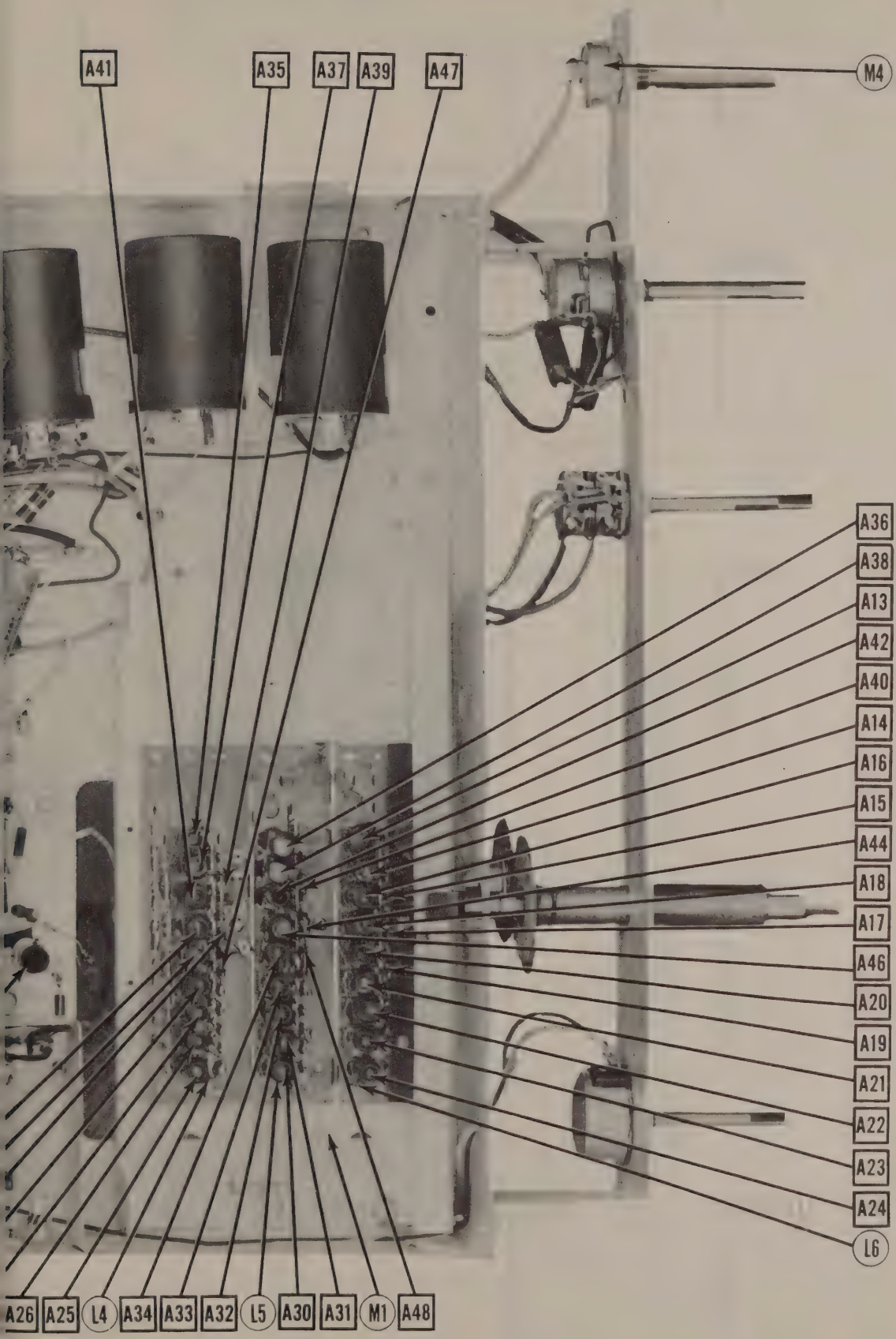
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM PIN 3 OF V19.
¶ MEASURED FROM PIN 1 OF DEFLECTION YOKE SOCKET.
* DO NOT MEASURE.

RESISTANCE READINGS

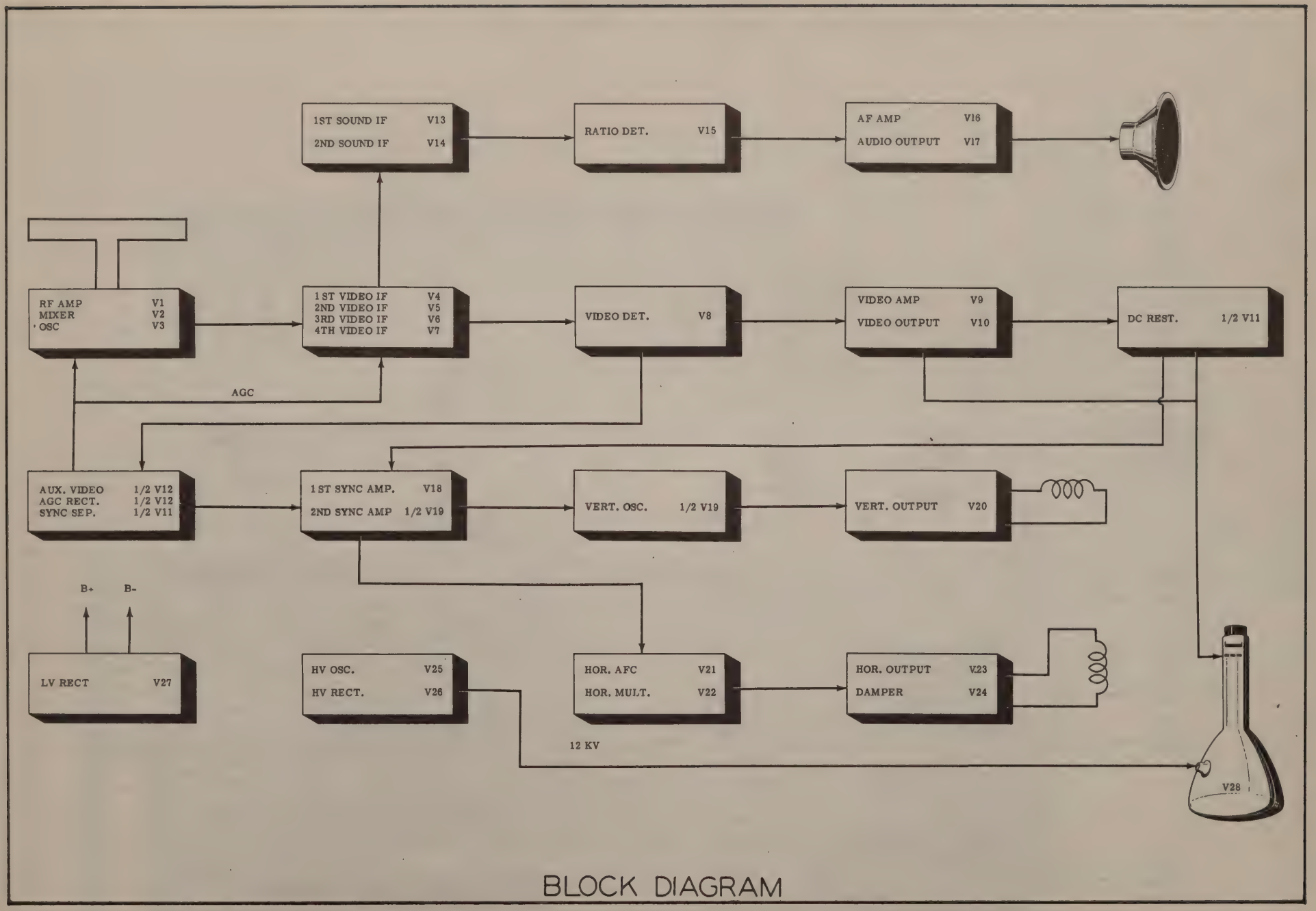
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	3.2 Meg.	100Ω	0Ω	.1Ω	†2.3KΩ	†15KΩ	0Ω		
V 2	6AG5	1 Meg.	0Ω	0Ω	.1Ω	†1.5KΩ	†15KΩ	0Ω		
V 3	6C4	†540Ω	Inf.	.1Ω	0Ω	†540Ω	18KΩ	0Ω		
V 4	6BH6	3.2 Meg.	100Ω	0Ω	.1Ω	†1.5KΩ	†16KΩ	0Ω		
V 5	6BH6	3.2 Meg.	100Ω	0Ω	.1Ω	†1.5KΩ	†16KΩ	0Ω		
V 6	6BH6	2Ω	100Ω	0Ω	.1Ω	†1.5KΩ	†16KΩ	0Ω		
V 7	6BH6	2Ω	100Ω	0Ω	.1Ω	†1.5KΩ	†16KΩ	0Ω		
V 8	6AL5	#190Ω	#190Ω	0Ω	.1Ω	#3.3KΩ	0Ω	#3.3KΩ		
V 9	6AU6	#3.3KΩ	#47Ω	#.1Ω	#0Ω	†5.1KΩ	68KΩ	#1.5KΩ		
V 10	6AK6	#470KΩ	#47Ω	#.1Ω	#0Ω	†10KΩ	†100KΩ	#820Ω		
V 11	6AL5	220KΩ	#4KΩ	.1Ω	0Ω	#1 Meg.	0Ω	10KΩ		
V 12	6T8	Inf.	1 Meg.	†13KΩ	#.1Ω	#0Ω	Inf.	#470Ω	#3.3KΩ	†13KΩ
V 13	6AU6	#440KΩ	#0Ω	#0Ω	#.1Ω	.1Ω	0Ω	#2Ω		
V 14	6AU6	#100KΩ	0Ω	#0Ω	#.1Ω	.1Ω	0Ω	#68Ω		
V 15	6AL5	Inf.	Inf.	#.1Ω	#0Ω	#0Ω	#0Ω	#20KΩ		
V 16	6AT6	#10Meg.	#0Ω	#.1Ω	#0Ω	#240KΩ	#240KΩ	†270KΩ		
V 17	6V6GT	0Ω	#0Ω	†3KΩ	†2.5KΩ	#470KΩ	Inf.	#.1Ω	#330Ω	
V 18	6J6	†27KΩ	†62KΩ	.1Ω	0Ω	10KΩ	1 Meg.	0Ω		
V 19	6SN7GT	#1.5Meg.	†340KΩ †330KΩ	#0Ω	#2.2KΩ	†17KΩ	#2.2KΩ	#0Ω	#.1Ω	
V 20	6V6GT	0Ω	#.1Ω	†14KΩ †4KΩ	†14KΩ †4KΩ	#3.3Meg.	#0Ω	#0Ω	#5.5KΩ #470Ω	
V 21	6AL5	Inf.	Inf.	#.1Ω	#0Ω	#100KΩ	#0Ω	#100KΩ		
V 22	12AU7	†200KΩ	#850KΩ	#1000Ω	#0Ω	#0Ω	†60KΩ	Inf.	#1000Ω	#.1Ω
V 23	6BG6G	Inf.	#.1Ω	¶180Ω	†10KΩ	¶470KΩ	Inf.	#0Ω	†10KΩ	TOP CAP †8KΩ †480Ω
V 24	5V4G	Inf.	†8KΩ †460Ω	Inf.	550Ω	620Ω	550Ω	Inf.	†8KΩ †460Ω	
V 25	6SN7GT	#4KΩ	†240Ω	#220Ω	#4KΩ	†240Ω	#220Ω	#.1Ω	#0Ω	
V 26	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †900Ω
V 27	5U4G	Inf.	4.5KΩ	Inf.	¶42Ω	Inf.	¶40Ω	Inf.	4.5KΩ	
V 28	16AP4	0Ω	#1.5Meg.	PIN 10 †500Ω	PIN 11 #20KΩ #6.5KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V27.
# MEASURED FROM PIN 3 OF V19.
¶ MEASURED FROM PIN 1 OF DEFLECTION YOKE SOCKET.

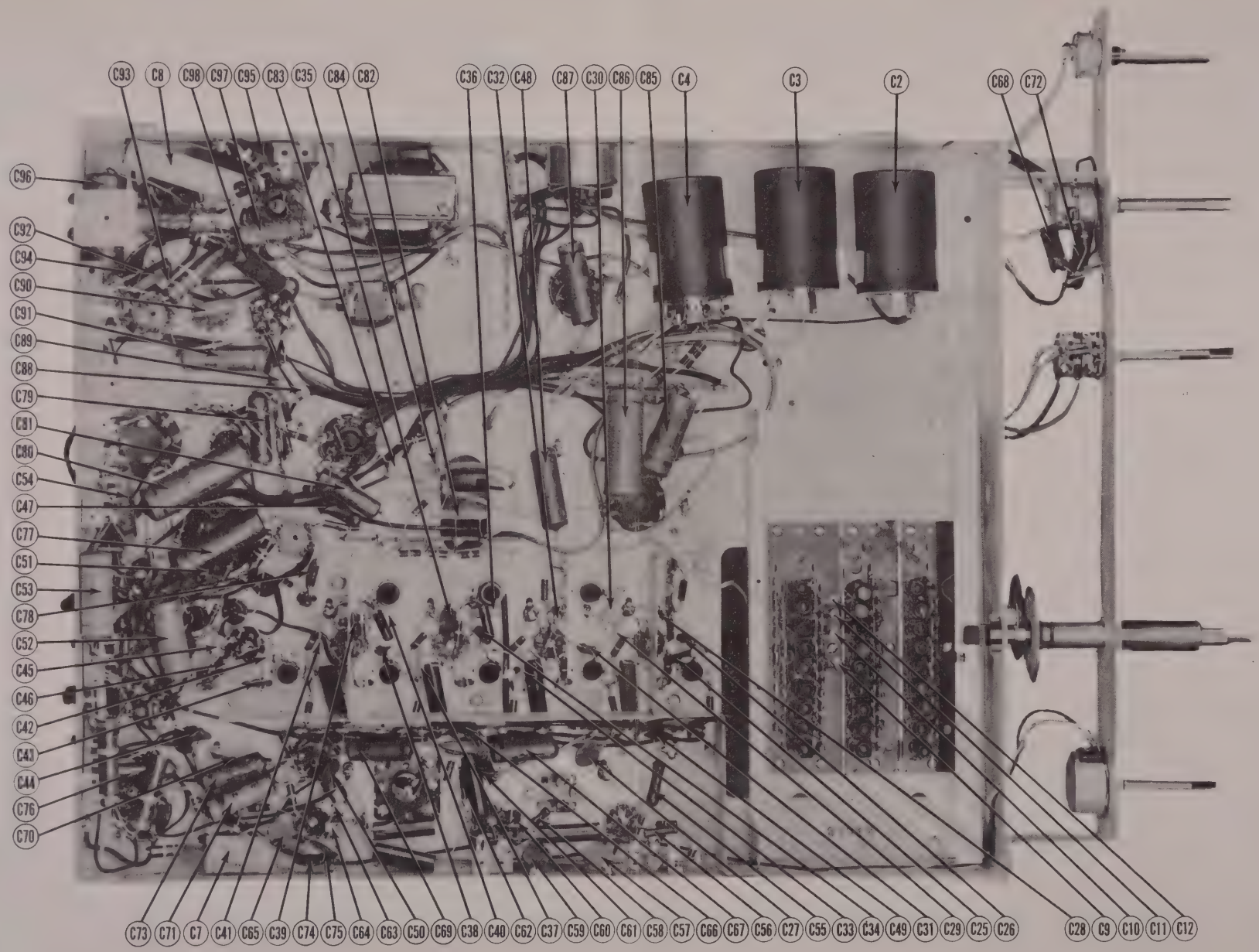
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



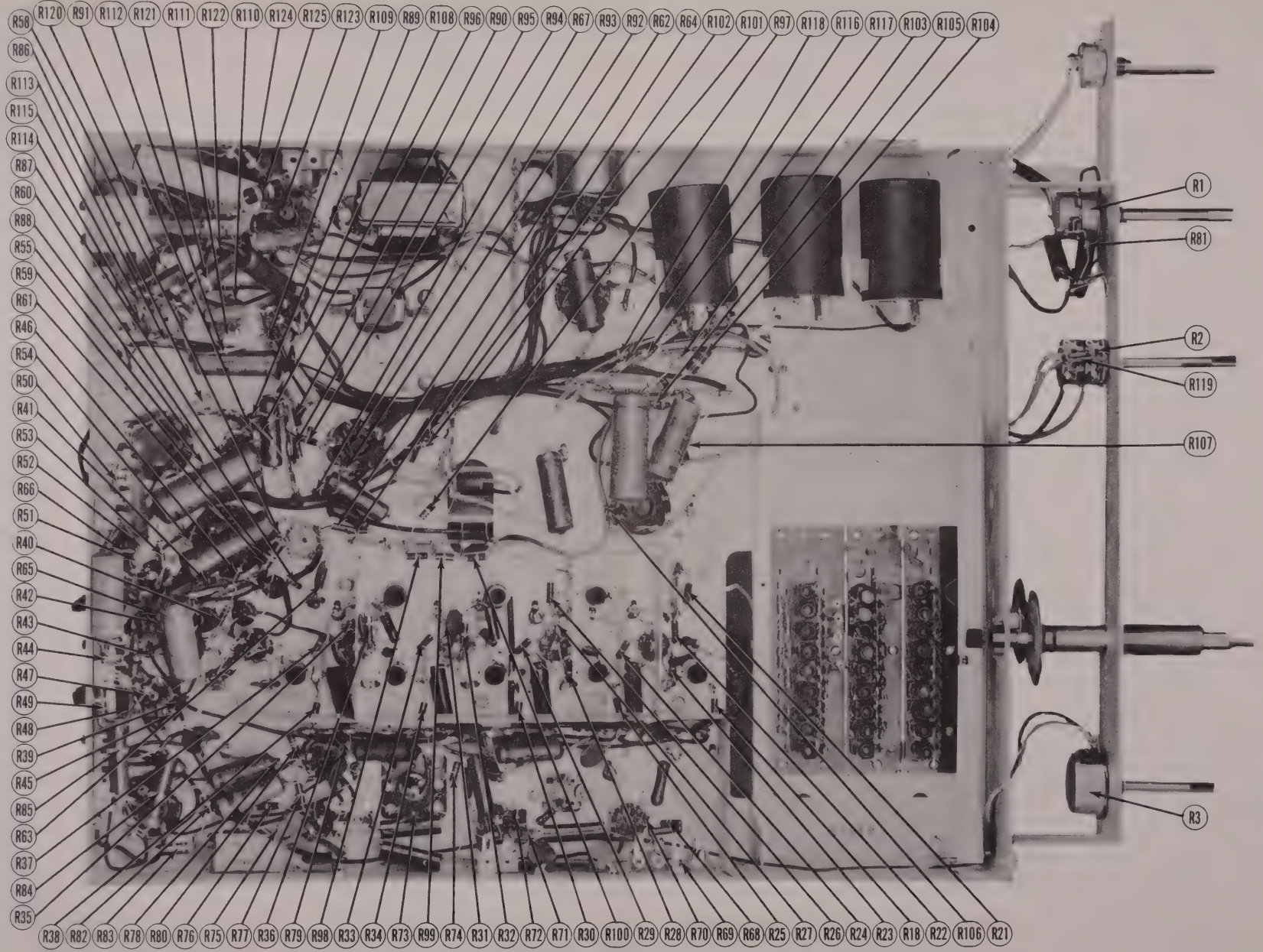
TOR AND ALIGNMENT IDENTIFICATION



BLOCK DIAGRAM



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SPARTON PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6BH6	6BH6	7CM	
V5	2nd Video IF	6BH6	6BH6	7CM	
V6	3rd Video IF	6BH6	6BH6	7CM	
V7	4th Video IF	6BH6	6BH6	7CM	
V8	Video Det.	6AL5	6AL5	6BT	
V9	Video Amp.	6AU6	6AU6	7BK	
V10	Video Output	6AK6	6AK6	7BK	
V11	DC Restorer-Sync. Sep.	6AL5	6AL5	6BT	
V12	Aux. Video-AGC Rect.	6T8	6T8	9E	
V13	1st Sound IF	6AU6	6AU6	7BK	
V14	2nd Sound IF	6AU6	6AU6	7BK	
V15	Ratio Det.	6AL5	6AL5	6BT	
V16	AF Amp.-AVC	6AT6	6AT6	7BT	
V17	Audio Output	6V6GT	6V6GT	7AC	
V18	1st Sync. Amp.	6J6	6J6	7BF	
V19	2nd Sync. Amp.-Vert. Osc.	6SN7GT	6SN7GT	8BD	
V20	Vert. Output	6V6GT	6V6GT	7AC	
V21	Hor. AFC	6AL5	6AL5	6BT	
V22	Hor. Multivib.	12AU7	12AU7	9A	
V23	Hor. Output	6BG6G	6BG6G	5BT	
V24	Damper	5V4G	5V4G	5L	
V25	HV Osc.	6SN7GT	6SN7GT	8BD	
V26	HV Rectifier	1B3GT	1B3GT	3C	
V27	LV Rectifier	5U4G	5U4G	5T	
V28	Picture Tube	16AP4	16AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450		AF88J	UP4445		TVL-64	● Filter
B	40	450						▲ Filter
C2	80	300		AF16I	UP7AJ1060		TVL-5	Filter
C3	80	300		AF16I	UP7AJ1060		TVL-5	Filter
C4A	15	350		AF444J4A	UP7DJ1044		EL-300	● Decoupling
B	15	350					TVA-16	■ 2nd Sync. Amp. Decoupling
C	15	350						▲ Hor. MV Decoupling
D	50	50						Vert. Output Cath. Bypass
C5A	10	400		AF222J4A	UP11145C		TVL-36†	● Pic. Tube Cath. Dec.
B	10	400					TVA-5	■ Output Decoupling
C	10	400						▲ 1st Sync. Amp. Dec.
D	20	25						Output Cathode Bypass
C6A	15	450		AFH322J4A	UP11145C		EL-431	● Decoupling
B	10	450					UT-8	■ 2nd V. Amp. Screen Bypass
C	10	450						▲ 1st V. Amp. Screen Bypass
D	20	25						2nd V. Amp. Cath. Bypass
C7	5	50		PRS150/4	BR550		TVA-13	Stabilizing Cap.
C8	4	50		PRS150/4	BR550		TVA-13	Voltage Stabilization
C9	15					NPOK-15		Fixed Trimmer
C10	15					NPOK-15		Fixed Trimmer
C11	15					NPOK-15		Fixed Trimmer
C12	15					NPOK-15		Fixed Trimmer
C13	47					GP1K-47		RF Coupling
C14	470					GP2K-470		AGC Filter
C15	470					GP2K-470		RF Screen Bypass
C16	470					GP2K-470		RF Bypass
C17	47					GP1K-47		RF Coupling
C18	1.5					NPOK-1.5		Osc. Coupling
C19	470					GP2K-470		Conv. Screen Bypass
C20	470					GP2K-470		Conv. Fil. Bypass
C21	10					N750K-10		Osc. Feedback
C22	10					N330-331-10		Fixed Trimmer
C23	470					GP2K-470		Osc. Filament Bypass
C24	100			1469-0001	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C25	1000			1468-001	1W5D1	GP2L-001	1FM-21	Conv. Plate Decoupling
C26	270			1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C27	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C28	1000			1468-001	1W5D1	GP2L-001	1FM-21	AGC Filter
C29A	1000			1468-001	1W5D1	GP2L-001	29C4	1st V. IF Screen Bypass
B	1000			1468-001	1W5D1	GP2L-001	29C4	1st V. IF Fil. Bypass
C	1000			1468-001	1W5D1	GP2L-001	29C4	1st V. IF Decoupling
C30	100			1469-0001	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C31	270			1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C32	1000			1468-001	1W5D1	GP2L-001	1FM-21	AGC Filter
C33A	1000			1468-001	1W5D1	GP2L-001	29C4	2nd V. IF Screen Bypass
B	1000			1468-001	1W5D1	GP2L-001	29C4	2nd V. IF Fil. Bypass
C	1000			1468-001	1W5D1	GP2L-001	29C4	2nd V. IF Decoupling
C34	270			1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C35	5000			1467-005	1D5D5	811-005	29C1	3rd V. IF Cath. Bypass
C36	470	500		1469-0005	5R5T5		MS-35	Fixed Trimmer
C37A	1000			1468-001	1W5D1	GP2L-001	29C4	3rd V. IF Screen Bypass
B	1000			1468-001	1W5D1	GP2L-001	29C4	3rd V. IF Fil. Bypass
C	1000			1468-001	1W5D1	GP2L-001	29C4	3rd V. IF Decoupling
C38	270			1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C39	5000			1467-005	1D5D5	811-005	29C1	4th V. IF Cath. Bypass
C40	470	500		1469-0005	5R5T5		MS-35	Fixed Trimmer
C41A	1000			1468-001	1W5D1	GP2L-001	29C4	4th V. IF Screen Bypass
B	1000			1468-001	1W5D1	GP2L-001	29C4	4th V. IF Fil. Bypass
C	1000			1468-001	1W5D1	GP2L-001	29C4	4th V. IF Decoupling
C42	22			1468-000025	5W5Q25	GP1K-22	MS-425	IF Coupling
C43	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C44	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C45	4.7			1468-000005	5W5V5	NPOK-4.7	MS-55	V. Diode Filter

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTON PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C46	4.7			1468-000005	5W5V5	NPOK-4.7	MS-55	V. Diode Filter
C47	100			1468-0001	5W5T1	GP1K-100	1FM-31	AGC Filter
C48	.1	200		P288-1	PTE4P1		TM-1	AGC Filter
C49	5000			1467-005	1D5D5	811-005	29C1	Filament Bypass
C50	5000			1467-005	1D5D5	811-005	29C1	Filament Bypass
C51	10			1468-00001	5W5Q1	GP1K-10	MS-41	1st V. Amp. Cath. Bypass
C52	.1	400		P488-1	PTE4P1		TM-1	Video Coupling
C53	.1	400		P488-1	PTE4P1		TM-1	Video Coupling
C54	.05	400		P488-05	PTE4S5		TM-15	Video Coupling
C55	100			1468-0001	5W5T1	GP1K-100	1FM-31	S. IF Coupling
C56	1000			1468-001	1W5D1	GP2L-001	1FM-21	AVC Filter
C57	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C58	100			1468-0001	5W5T1	GP1K-100	1FM-31	S. IF Coupling
C59	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C60	1000			1468-001	1W5D1	GP2L-001	1FM-21	2nd S. IF Cath. Bypass
C61	5000			1467-005	1D5D5	811-005	29C1	2nd S. IF Fil. Bypass
C62	5000			1467-005	1D5D5	811-005	29C1	2nd S. IF Fil. Bypass
C63	47			1468-00005	5W5Q5	GP1K-47	1FM-45	Diode Load Cap. *
C64	47			1468-00005	5W5Q5	GP1K-47	1FM-45	Diode Load Cap. *
C65	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C66	2000			1467-002	1W5D3	GP2M-002	29C2	De-emphasis
C67	.02	400		P488-02	PTE4S2		TM-12	Audio Coupling
C68	.03	200		P488-03	PTE6S3		TM-13	Tone Compensation
C69	.02	400		P488-02	PTE4S2		TM-12	Audio Coupling
C70	1000			1468-001	1W5D1	GP2L-001	1FM-21	AVC Filter
C71	.05	200		P288-05	PTE4S5		TM-15	AVC Filter
C72	.005	200		P688-005	PTE6D5	811-005	TM-25	Tone Compensation
C73	.02	400		P488-02	PTE4S2		TM-12	Audio Coupling
C74	5000			1467-005	1D5D5	811-005	29C1	Ratio Det. Fil. Bypass
C75	5000			1467-005	1D5D5	811-005	29C1	Ratio Det. Fil. Bypass
C76	.006	600		P688-006	PTE6D6	GP2M-0056	TM-26	Output Plate Bypass
C77	.25	200		P288-25	GT2P25		TC-2	Sync. Coupling
C78	5000			1467-005	1D5D5	811-005	29C1	Aux. V. Fil. Bypass
C79	.01	400		P488-01	PTE4S1	821-01	TM-11	Sync. Coupling
C80	.25	400		P488-25	GT4P25		TC-2	Sync. Coupling
C81	.01	400		P488-01	PTE4S1	821-01	TM-11	Vert. Sync. Coupling
C82A	3300			P688-003	PTE6D3	GP2M-0033	TM-23	Integrator Net.
B	4700			P688-005	PTE6D5	811-005	TM-25	Integrator Net.
C	4700			P688-005	PTE6D5	811-005	TM-25	Integrator Net.
C83	4700	500		1467-005	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C84	5000			1467-005	1D5D5	811-005	29C1	Vert. Osc. Grid Cap.
C85	.1	400		P488-1	PTE4P1		TM-1	Vert. Discharge
C86	.25	400		P488-25	GT4P25		TC-2	Vert. Sweep Coupling
C87	.1	200		P288-1	PTE4P1		TM-1	Fixed Trimmer
C88	470	500		1468-0005	5W5T5	GP2K-470	1FM-35	Hor. Sync. Coupling
C89	470	500		1468-0005	5W5T5	GP2K-470	1FM-35	Hor. Sync. Coupling
C90	6800	300		P688-0068	1D3D7	GP2-334-0068	1FM-27	AFC Filter
C91	.1	200		P288-1	PTE4P1		TM-1	AFC Filter
C92	680	500			1W5T7	GP2K-680	1FM-37	Hor. Feedback
C93	220	500		1468-00025	5W5T25	GP2K-220	1FM-325	Hor. MV Feedback
C94	5000			1467-005	1D5D5	811-005	29C1	Hor. Sweep Coupling
C95	.25	400		P488-25	GT4P25		TC-2	Hor. Output Screen Bypass
C96	.5	200		P288-5	GT2P5		TC-5	Hor. Output Cath. Bypass
C97	.05	400		P488-05	PTE4S5		TM-15	Fixed Trimmer
C98	.06	400		P488-068	PTE4S5		TM-16	Hor. Sweep Coupling
C99	.05	400		P488-05	PTE4S5		TM-15	HV Osc. Decoupling
C100	.05	400		P488-05	PTE4S5		TM-15	HV Osc. Decoupling
C101	470	500		1469-0005	5R5T5		MS-35	Fixed Trimmer
C102	1500	500		1464-0015	1R5D15			Fixed Trimmer
C103	5600	500		1467-006	1D5D6	GP2M-0056	1FM-26	HV Osc. Grid Cap.
C104	.05	400		P488-05			TM-15	HV Osc. Cath. Bypass
C105	500	15000				410-500		HV Filter
C106	.05	600		P688-05			TM-15	Line Filter

* When either item C63 or C64 are replaced, replace both with capacitors of equal value.
† Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	1/2		B11-137 *		Tone control, front
B	330KΩ	1/2	PA4420-1	B18-132X *		Volume control, tapped at 60KΩ, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	300KΩ	1/2		B11-133 *		Horiz. hold control, front
B	500KΩ	1/2	PA4422-1	B11-133 *		Vert. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3	3000Ω	2	PA4421	W-3000	43-3000	Contrast control, wire wound
R4	10KΩ	2	PA4413	W-10, 000	43-10K	Vert. size control, wire wound
R5	7500Ω	4	PA4424			Horiz. size control, wire wound
R6	5000Ω	2	PA4411	W-5000	43-5000	Vert. linearity control, wire wound
R7	25KΩ	1/2	PA4412	Q11-130	M-40-S	Brightness control
R8	2000Ω	4	PA4425		10-2000	Focus control, wire wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	100KΩ 20%				Ant. Loading
R10	100KΩ 20%				Ant. Loading
R11	47KΩ			BTS-47K	RF Grid
R12	1000Ω			BTS-1000	AGC Network
R13	100Ω				RF Cathode
R14	2200Ω 5%			BTS-2200-5%	RF Plate
R15	15KΩ			BTS-15K	RF Screen
R16	1 Meg.			BTS-1 Meg.	Mixer Grid
R17	56KΩ			BTS-56K	Mixer Screen
R18	1500Ω 20%			BTS-1500	Mixer Plate Decoupling
R19	18KΩ			BTS-18K	Osc. Grid
R20	470Ω			BTS-470	Osc. Plate

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
R21	1000Ω 30%			BTS-1000	AGC Network
R22	15KΩ 5%				1st Video IF Grid
R23	100Ω				1st Video IF Cathode
R24	15KΩ				1st Video IF Screen
R25	1500Ω 20%			BTS-1500	1st Video IF Decoupling
R26	1000Ω 20%			BTS-1000	AGC Network
R27	4700Ω 5%			BTS-4700-5%	2nd Video IF Grid
R28	100Ω				2nd Video IF Cathode
R29	15KΩ				2nd Video IF Screen
R30	1500Ω 30%			BTS-1500	2nd Video IF Decoupling
R31	15KΩ 5%			BTS-15K-5%	3rd Video IF Grid
R32	100Ω				3rd Video IF Cathode
R33	15KΩ				3rd Video IF Screen
R34	1500Ω 20%			BTS-1500	3rd Video IF Decoupling
R35	2200Ω 5%			BTS-2200-5%	4th Video IF Grid
R36	100Ω				4th Video IF Cathode
R37	15KΩ				4th Video IF Screen
R38	1500Ω 20%			BTS-1500	4th Video IF Decoupling
R39	150Ω 20%				Video Det. Diode Load
R40	3300Ω 5%			BTS-3300-5%	Video Amp. Grid
R41	2700Ω			BTS-2700	Video Amp. Cathode
R42	68KΩ			BTS-68K	Video Amp. Screen
R43	1800Ω			BTS-1800	Video Amp. Plate
R44	3900Ω			BTS-3900	Peaking Coil Shunt
R45	470KΩ 20%			BTS-470K	Video Output Grid
R46	820Ω	2		BTS-820	Video Output Cathode
R47	100KΩ	1		BTA-100K	Video Output Screen
R48	6800Ω 5%	2		BT-2-6800-5%	Video Output Plate
R49	3300Ω	1		BTA-3300	Decoupling
R50	22KΩ	1/2		BTS-22K	Isolation
R51	470KΩ			BTS-470K	Picture Tube Grid
R52	1 Meg. 20%			BTS-1 Meg.	DC Rest. Load
R53	4700Ω			BTS-4700	Voltage Divider
R54	4700Ω			BTS-4700	Voltage Divider
R55	47Ω			BW-½-47	Bias Network
R56	68000Ω	1		BTA-6800	Voltage Divider
R57	47KΩ	1		BTA-47K	Voltage Divider
R58	3300Ω 5%			BTS-3300-5%	Aux. Video Grid
R59	470Ω			BTS-470	Aux. Video Cathode
R60	47KΩ			BTS-47K	Voltage Divider
R61	100KΩ	1/2		BTA-100K	Aux. Video Plate
R62	1 Meg. 20%			BTS-1 Meg.	AGC Rect. Diode Load
R63	10KΩ 5%			BTS-10K-5%	Aux. Video Plate Bleeder
R64	2.2 Meg. 20%			BTS-2.2 Meg.	AGC Network
R65	220KΩ 20%			BTS-220K	Sync. Sep. Load
R66	10KΩ 20%			BTS-10K	Sync. Sep. Load
R67	12KΩ			BTS-12K	Voltage Divider
R68	100KΩ				1st Sound IF Grid
R69	100KΩ 20%			BTS-100K	AVC Network
R70	82Ω				1st Sound IF Cathode
R71	100KΩ			BTS-100K	2nd Sound IF Grid
R72	68Ω				2nd Sound IF Cathode
R73	220Ω				Balancing
R74	27KΩ			BTS-27K	De-emphasis
R75	10KΩ			BTS-10K	Ratio Det. Diode Load
R76	10KΩ			BTS-10K	Ratio Det. Diode Load
R77	220KΩ 20%			BTS-220K	AVC Network
R78	2.2 Meg. 20%			BTS-2.2 Meg.	AVC Network
R79	10 Meg. 20%			BTS-10 Meg.	AF Grid
R80	270KΩ			BTS-270K	AF Plate
R81	10KΩ			BTS-10K	Tone Compensation
R82	470KΩ 20%			BTS-470K	Output Grid
R83	330Ω	1		BTA-330	Output Cathode
R84	1200Ω	2		BW-2-1200	Filter
R85	1200Ω	2		BW-2-1200	Filter
R86	470Ω 20%			BTS-470	Acc. Anode Decoupling
R87	15KΩ 20%			BTS-15K	1st Sync. Amp. Plate
R88	47KΩ 20%			BTS-47K	1st Sync. Amp. Plate Decoupling
R89	22KΩ 20%			BTS-22K	1st Sync. Amp. Grid
R90	1 Meg. 20%			BTS-1 Meg.	1st Sync. Amp. Grid
R91	27KΩ			BTS-27K	1st Sync. Amp. Plate
R92	3300Ω			BTS-3300	2nd Sync. Amp. Grid
R93	2200Ω 5%			BTS-2200-5%	2nd Sync. Amp. Cathode
R94	12KΩ			BTS-12K	2nd Sync. Amp. Plate
R95	3300Ω 5%			BTS-3300-5%	2nd Sync. Amp. Plate
R96	2200Ω 20%			BTS-2200	2nd Sync. Amp. Plate Decoupling
R97	47KΩ			BTS-47K	Voltage Divider
R98	22KΩ			BTS-22K	Integrator
R99	8200Ω			BTS-8200	Integrator
R100	8200Ω			BTS-8200	Integrator
R101	820KΩ			BTS-820K	Vert. Osc. Grid
R102	220KΩ 20%			BTS-220K	Vert. Osc. Grid
R103	330KΩ 5%			BTS-330K-5%	Vert. Osc. Plate
R104	2700Ω	1		BTA-2700	Decoupling
R105	3900Ω			BTS-3900	Vert. Peaking
R106	3.3 Meg. 20%			BTS-3.3 Meg.	Vert. Output Grid
R107	470Ω 20%			BTS-470	Vert. Output Cathode
R108	100KΩ 5%			BTS-100K-5%	Horiz. AFC Diode Load
R109	100KΩ 5%			BTS-100K-5%	Horiz. AFC Diode Load
R110	3300Ω			BTS-3300	Feedback
R111	470KΩ			BTS-470K	Horiz. AFC Filter Network
R112	1000Ω			BTS-1000	Horiz. MV Cathode
R113	47KΩ			BTS-47K	Horiz. MV Plate
R114	180KΩ			BTS-180K	Horiz. MV Plate
R115	470KΩ			BTS-470K	Horiz. MV Grid
R116	390KΩ 5%			BTS-390K-5%	Voltage Divider
R117	330KΩ 5%			BTS-330K-5%	Series Neon
R118	12KΩ	1		BTA-12K	Decoupling
R119	82KΩ 5%			BTS-82K-5%	Voltage Divider
R120	470KΩ			BTS-470K	Horiz. Output Grid
R121	180Ω	2		BW-2-180	Horiz. Output Cathode
R122	10KΩ	2		BT-2-10K	Horiz. Output Screen
R123	68Ω			BW-½-68	Linearity Network
R124	270Ω	2		BW-2-270	Linearity Network

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
R125	270Ω	2		BW-2-270	Linearity Network
R126	180Ω	2		BW-2-180	Focus Coil Shunt
R127	180Ω	2		BW-2-180	Focus Coil Shunt
R128	100Ω 20%	½		BW-½-100	HV Osc. Decoupling
R129	100Ω 20%	½		BW-½-100	HV Osc. Decoupling
R130	3900Ω	1		BTA-3900	HV Osc. Grid
R131	220Ω	1		BW-1-220	HV Osc. Cathode
R132	470KΩ 20%	½			HV Filter
R133A	5000Ω	8		AB-5000	Bleeder-Wire Wound
B	10KΩ	3		AB-10K	Bleeder-Wire Wound

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC at 1.98A	760VCT .230ADC	5VAC at 3A	6.3VAC at 5A SEC. 4 6.3VAC at 5.8A			P-3061 ②	

② Drill new mounting holes.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T2	6.3VAC at 2.6A	5VAC at 2A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T3	160Ω	750Ω		A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T4	410Ω						Hor. Output Plate Choke
T5	640Ω	6.2Ω		A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	32Ω						Hor. Deflection Coil
B	65Ω						Vert. Deflection Coil
T7	425Ω						Focus Coil

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T8	1.7Ω	690Ω	17.5Ω	0Ω				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T9	6.2KΩ	4Ω	420Ω	.4Ω		A-3849	A-2902	RO-13 ③	③Drill new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.230A	70Ω	5 Henries		C-1412 ②	C-3196 ②	TR-3300 ②②	②Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Wave Trap	MΩ				Part of tuner
L3	Wave Trap	MΩ				Part of tuner
L4	Ant. Coils	Ω				Part of tuner
L5	RF Coils	Ω				Part of tuner
L6	Osc. Coils	Ω				Part of tuner
L7	Fil. Choke	.MΩ				Part of tuner
L8	Fil. Choke	.MΩ				Part of tuner
L9	Osc. Plate Choke	.MΩ				Part of tuner
L10	Adjacent Sound IF Trap	Ω				Part of tuner
L11	RF Trap	.MΩ				Includes 2.5MMF capacitor
L12	1st Video IF	.MΩ				
L13	Adjacent Sound IF Trap	.MΩ				
L14	2nd Video IF	.MΩ				
L15	Fil. Choke	.MΩ				
L16	3rd Video IF	.MΩ				
L17	Fil. Choke	.MΩ				
L18	3rd Video IF Grid Choke	2Ω				11 microhenries
L19	Sound Take-Off	Ω				
L20	4th Video IF	.MΩ				
L21	Fil. Choke	.MΩ				

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

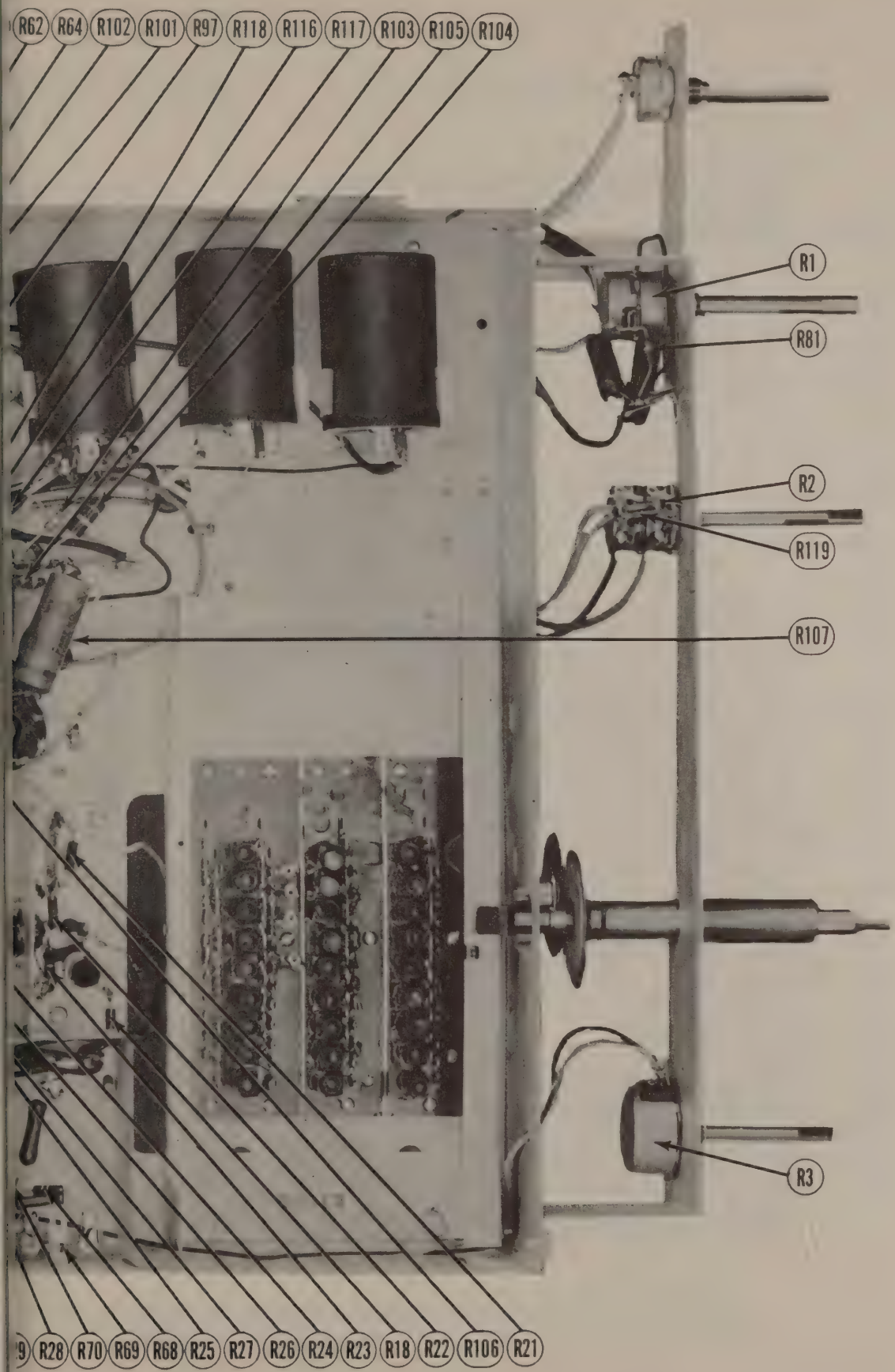
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SPARTON PART No.	MEISSNER PART No.	
L22	4th Video IF Grid Choke	2Ω				11 microhenries
L23	Sound Trap	0Ω				
L24	Fil. Choke	.1Ω				
L25	5th Video IF	.1Ω				
L26	Peaking	2.9Ω				Inductance-25 microhenries
L27	Peaking	6.5Ω				Inductance-95 microhenries
L28	Peaking	6.5Ω				Inductance-95 microhenries
L29	Peaking	8Ω				Inductance-83 microhenries
L30	Peaking	10Ω				Inductance-235 microhenries
L31	Peaking	8.5Ω				Inductance-150 microhenries
L32	Peaking	7.9Ω				Inductance-135 microhenries
L33	Peaking	10Ω				Inductance-200 microhenries
L34	Sound IF	.3Ω				
L35	RF Choke	.1Ω				
L36	RF Choke	.1Ω				Not used in all models
L37	RF Choke	.1Ω				Not used in all models
L38	RF Choke	.1Ω				
L39	Fil. Choke	.1Ω				
L40	Fil. Choke	.1Ω				
L41	Ratio Det. Trans.	.6Ω	.1Ω			
L42	Hor. Linearity	15Ω				
L43	RF Choke	17Ω				Inductance-600 microhenries

SPEAKER

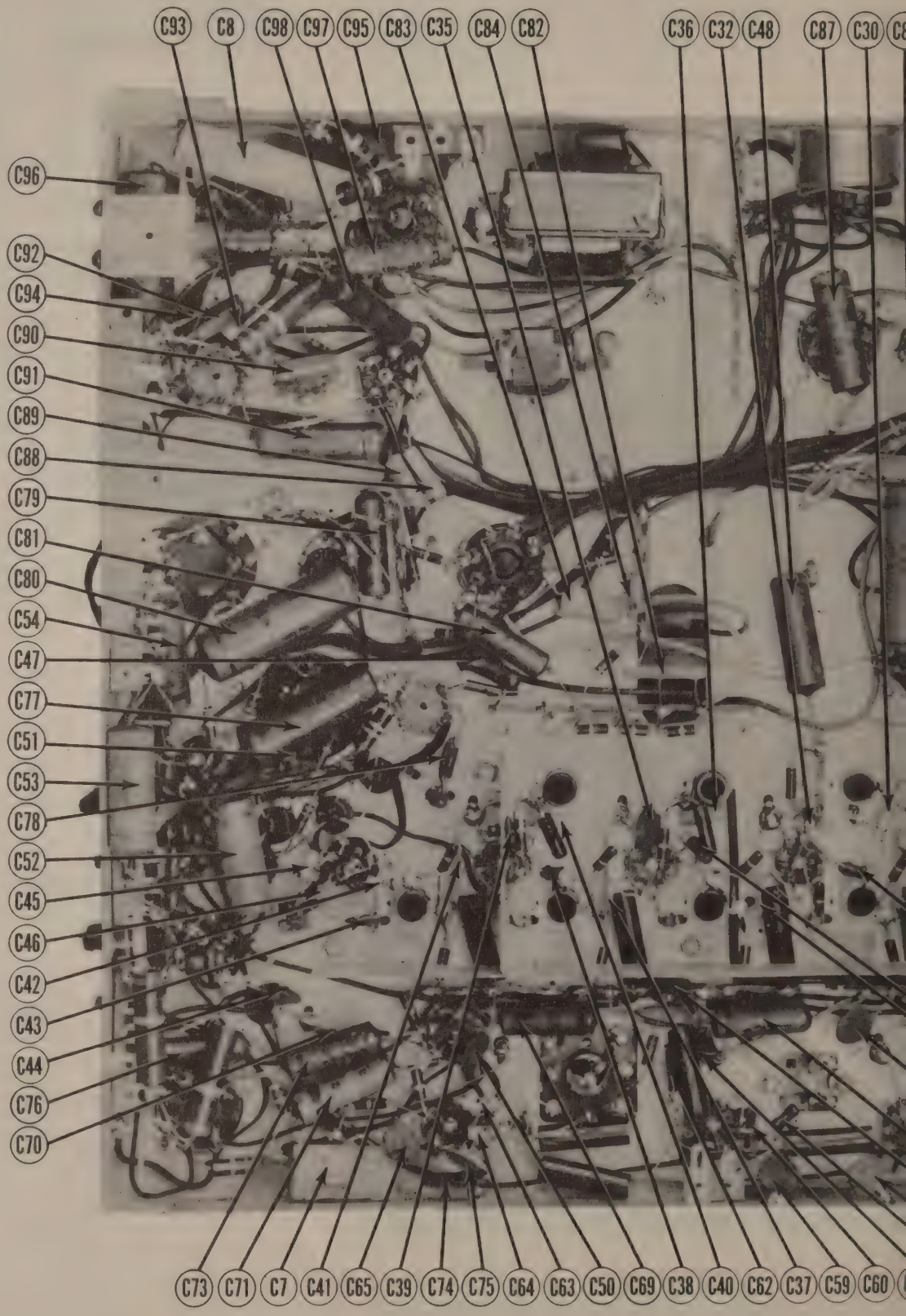
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	SPARTON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	4Ω		ST-120 ① MOD. P10-S	10A4A	①Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2	9 1/2"	1"				

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M1	RF Tuner		
M2	Neon Bulb		
M3	Ion Trap		
M4	On-Off SW.		
M5	Trimmer		Fine tuning (0.5-1.5MMF)



ESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-

PHOTOFACT* Folder

TRAV-LER MODELS
10-T, 12-T, 16-T

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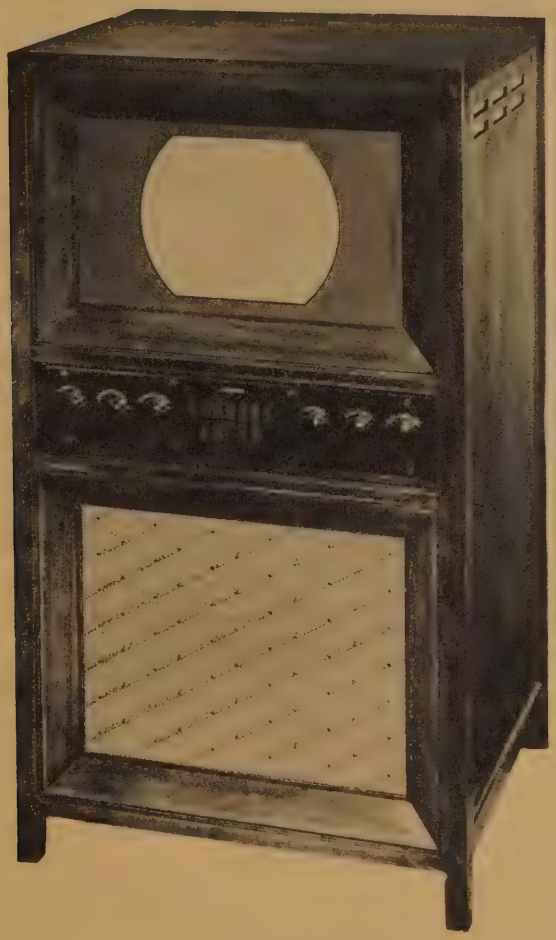

MODEL 10-T

TRAV-LER MODELS
10-T, 12-T, 16-T

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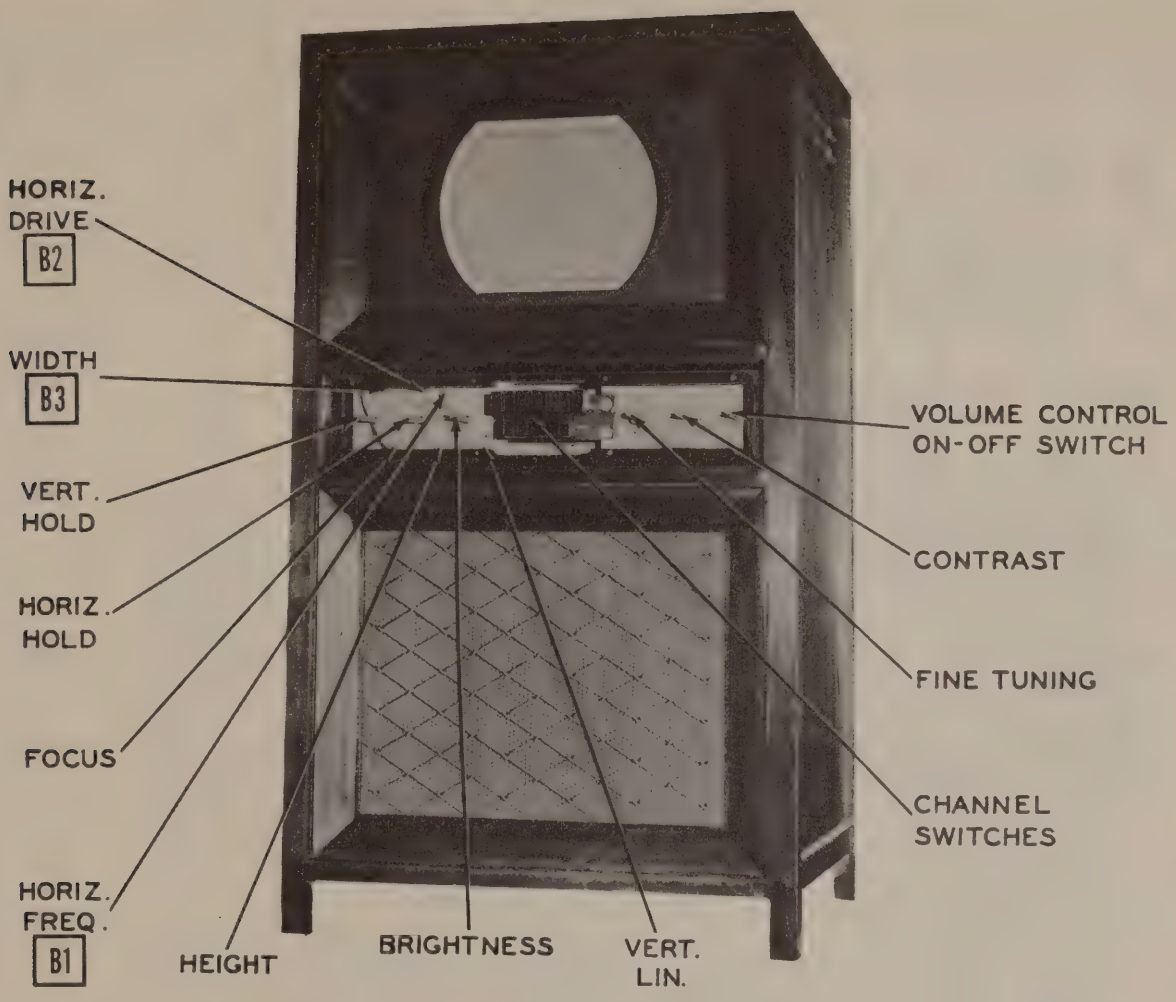

TRAV-LER
MODELS 10-T, 12-T

TRAV-LER MODEL 10-T

TRADE NAME	Trav-Ler Models 10-T, 12-T
MANUFACTURER	Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago 6, Illinois
TYPE SET	Television Receiver
TUBES	Twenty Four
POWER SUPPLY	110-120 Volts AC — RATING 1.7 Amp. at 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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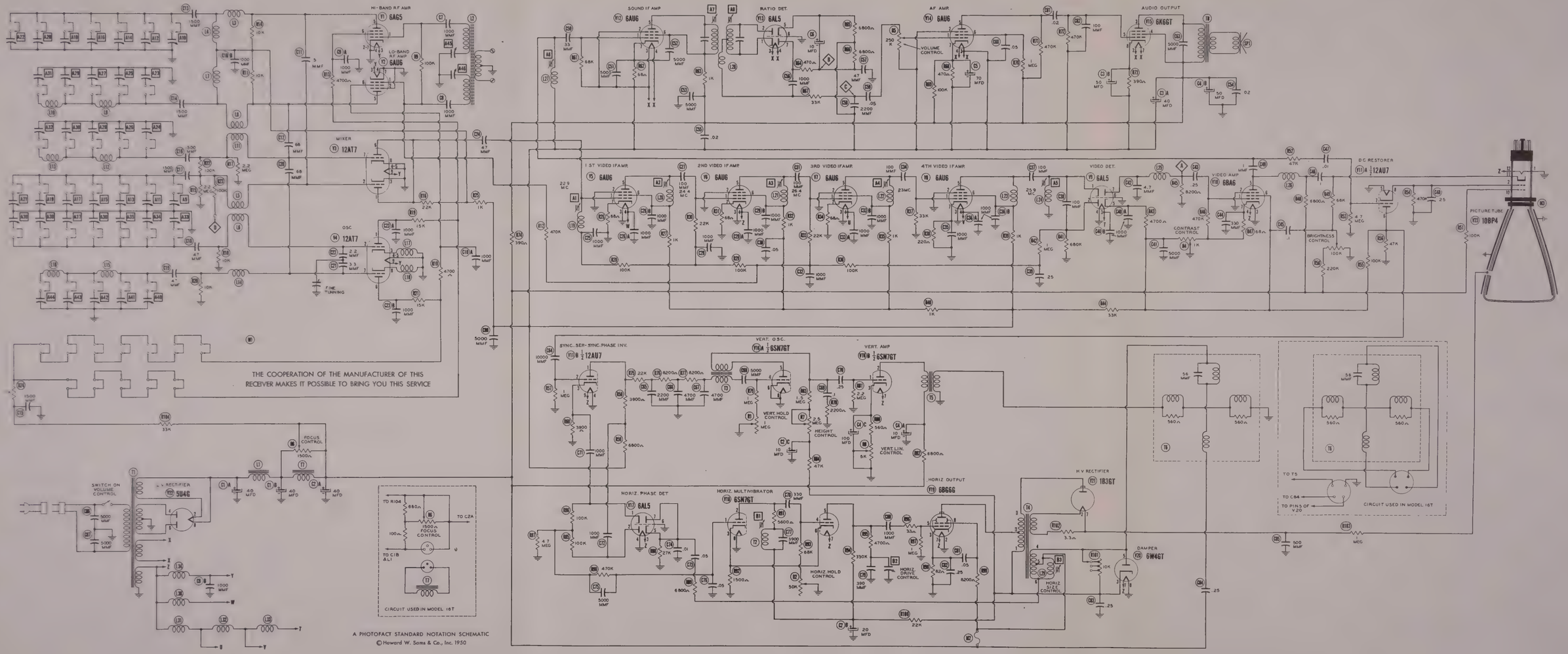

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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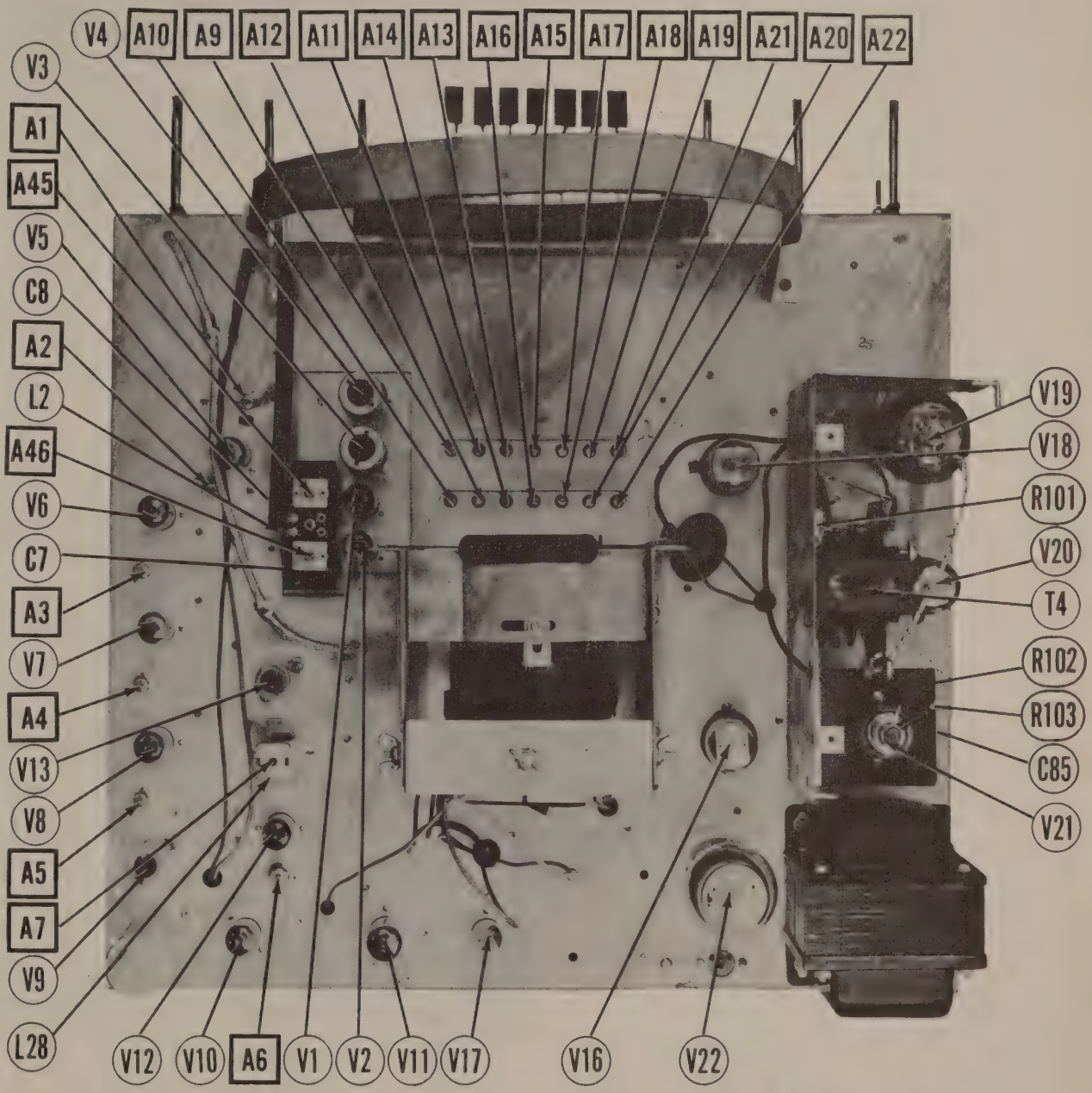
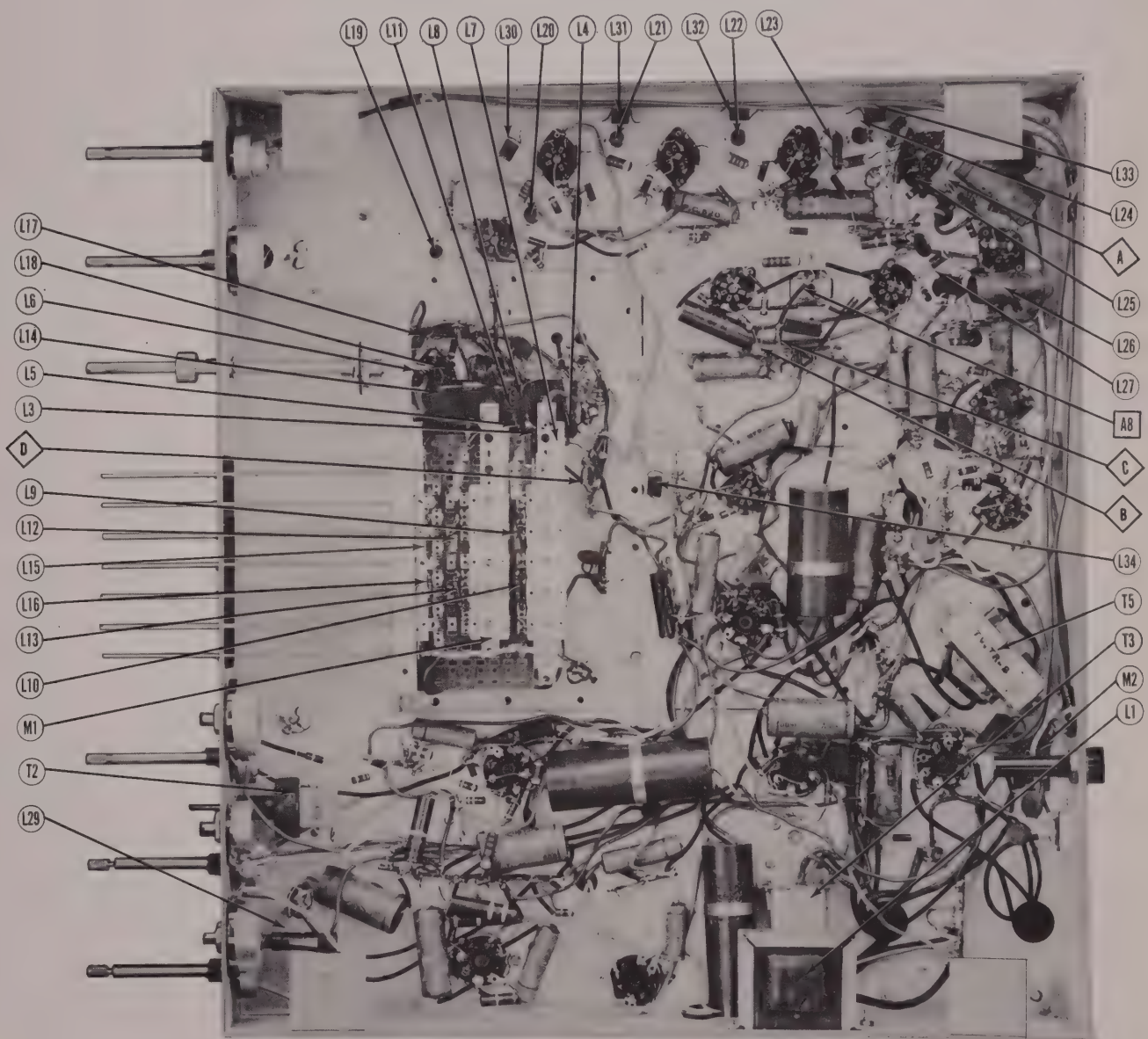
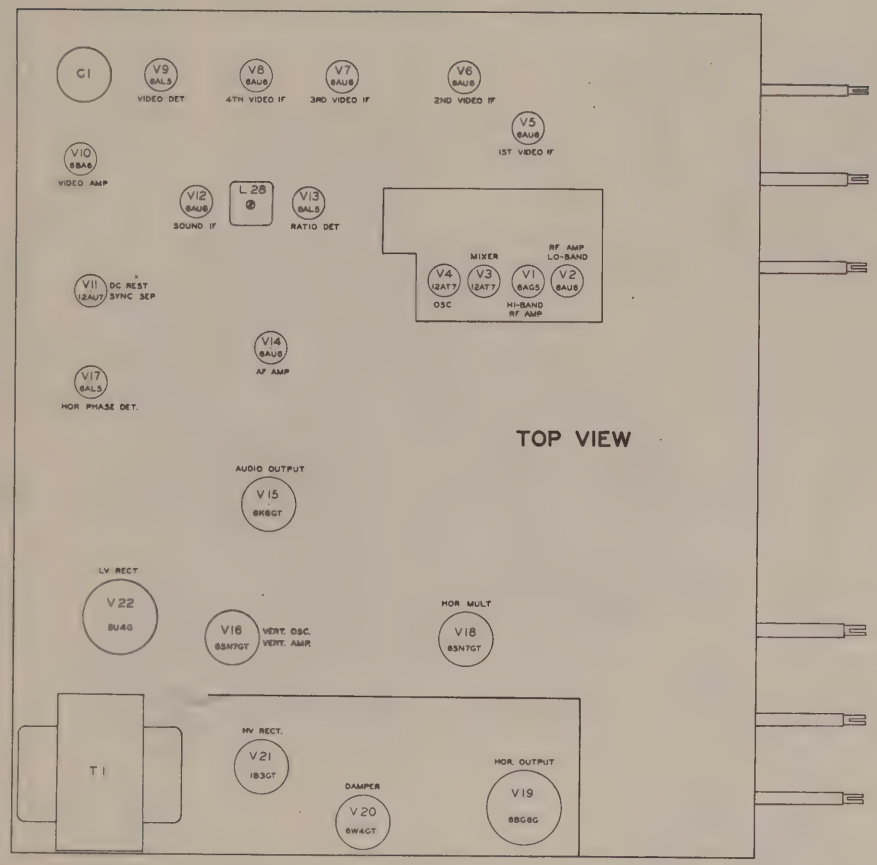
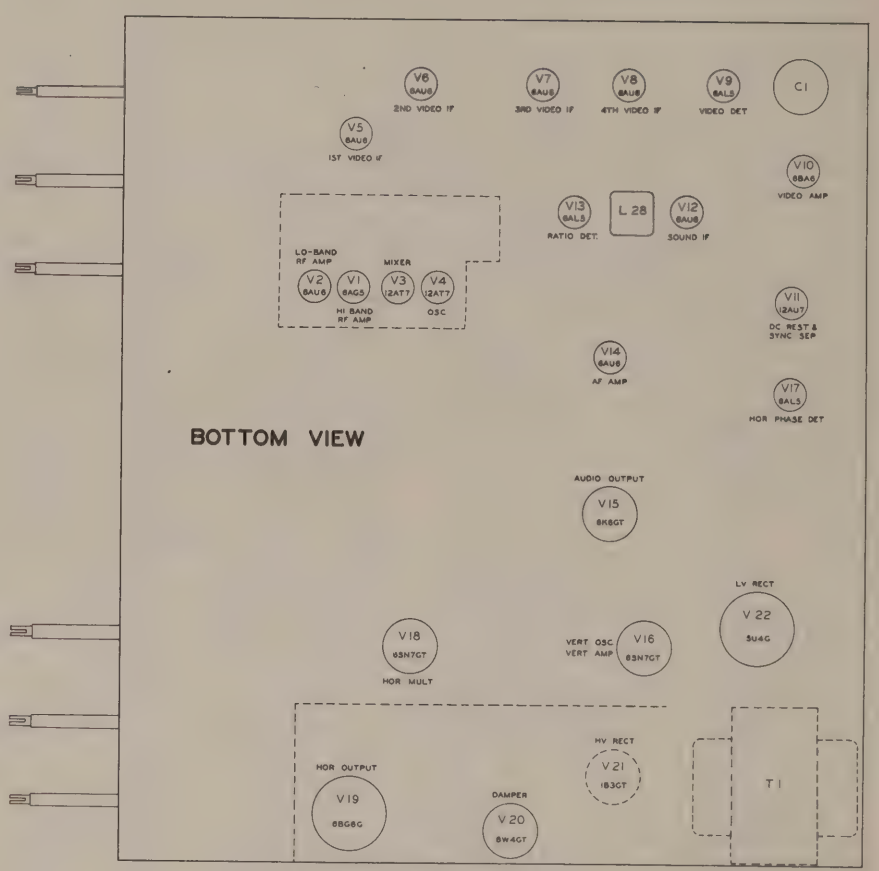


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the set is to be aligned with the picture tube removed, remove the horizontal oscillator tube (V18) to eliminate the high voltage shock hazard.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R36 and R42, connect the positive lead to chassis.
Remove the local oscillator tube (V4), to eliminate the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V3). Low side to chassis.	22.9MC (Unmod.)	Any	DC Probe to Point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	24.4MC	"	"	A2	"
3.	Direct	"	26.4MC	"	"	A3	"
4.	Direct	"	23MC	"	"	A4	"
5.	Direct	"	25.9MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over mixer tube (V3). Low side to chassis.	24MC (10MC Sweep)	21.75MC 26.25MC	Any	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1 with markers as shown. If necessary slightly retouch A1 thru A5 for proper response. The dip between peaks should not exceed 30%.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound alignment the case of the VTVM is at 150 volts positive with respect to chassis. Avoid grounding or touching the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V10). Low side to chassis.	4.5MC (Unmod.)	Any channel unused locally	DC Probe to Point (B) Common to pin 2 of V14.	A6, A7	Adjust for maximum deflection.
8.	.01MFD	"	"	"	DC Probe to Point (C) Common to pin 2 of V14.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V10). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any channel unused locally	Vert. Amp. to Point (B) Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per Fig 2.
8.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A8	Reconnect capacitor C6. Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

The RF circuits are very stable and will not normally require alignment. Alignment should not be attempted unless they are definitely known to be out of alignment, and the proper equipment is available.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Remove V5 and V9 from their sockets.
Short-circuit L19.
Connect the negative lead of a 1½ volt battery to the junction of R29 and R36, connect the positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Sweep)	211.25MC 215.75MC	13	Vert. Amp. to Point (D) Low side to chassis.	A9, A10	Adjust for response curve similar to Fig 4 with markers as shown.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A11, A12	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A13, A14	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A15, A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17, A18	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A19, A20	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A21, A22	
10.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A23, A24	Adjust for curve similar to Fig 5 with markers as shown.
			79MC (10MC SWP)	77.25MC 81.75MC	5		A25, A26	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A27, A28	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A29, A30	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A31, A32	

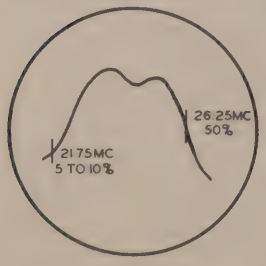


FIG. 1

FIG. 2

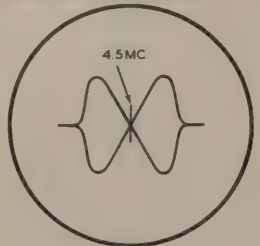


FIG. 3

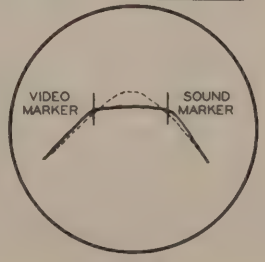


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Replace the local oscillator tube (V4).
Set the contrast control to the mid-position of its range.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A) Low side to chassis.	A33	Adjust for response curve similar to Fig 6. The video marker should be at 50% and the sound marker should be at 5 to 10%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A34	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A35	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A36	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A37	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A38	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A39	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A40	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A41	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A42	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A43	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A44	

ANTENNA ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (Unmod.)	10	DC Probe to Point (A) Common to chassis.	A45	Adjust for maximum deflection.
13.	"	"	69MC (Unmod.)	4	"	A46	"

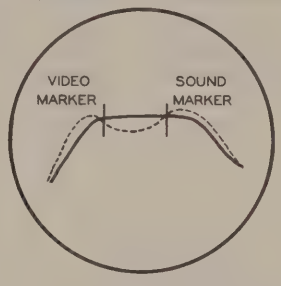
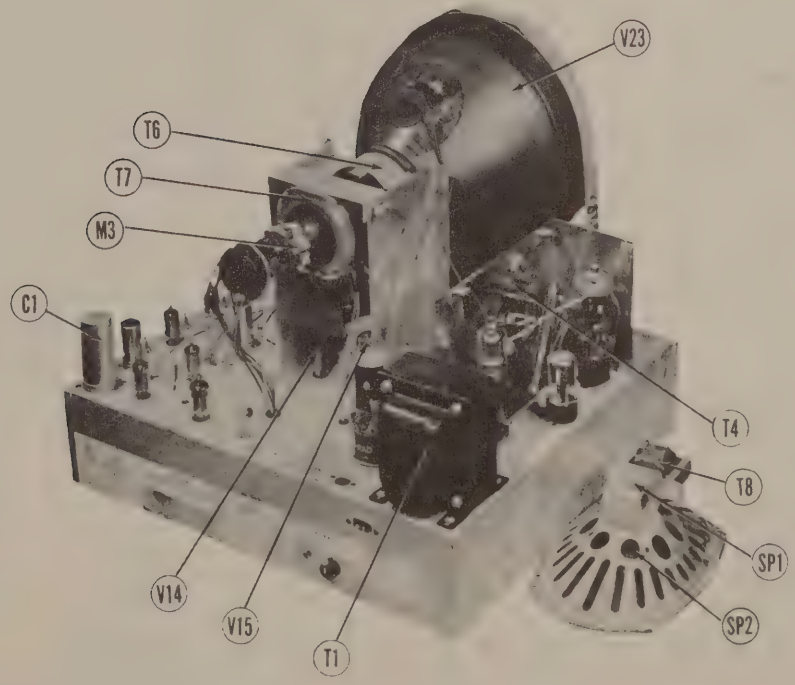


FIG. 5

FIG. 6



CHASSIS–TOP VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	▲-1.2VDC	0V.	6.3VAC	0V.	▲190VDC	▲215VDC	▲0V.		
V 2	6AU6	♦-.9VDC	0V.	6.3VAC	0V.	♦135VDC	♦140VDC	0V.		
V 3	12AT7	▲75VDC	▲-.9VDC	0V.	0V.	0V.	♦100VDC	♦-1.1VDC	♦0V.	6.3VAC
V 4	12AT7	▲100VDC	▲§-.2VDC	0V.	0V.	0V.	♦130VDC	♦§-.2VDC	♦0V.	6.3VAC
V 5	6AU6	-.4VDC	0V.	0V.	6.3VAC	117VDC	135VDC	.4VDC		
V 6	6AU6	-.3VDC	0V.	0V.	6.3VAC	117VDC	135VDC	.4VDC		
V 7	6AU6	-.3VDC	0V.	0V.	6.3VAC	117VDC	135VDC	.4VDC		
V 8	6AU6	0V.	0V.	0V.	6.3VAC	190VDC	150VDC	2VDC		
V 9	6AL5	0V.	-.5VDC	6.3VAC	0V.	0V.	0V.	-.3VDC		
V 10	6BA6	2.8VDC	0V.	0V.	6.3VAC	290VDC	162VDC	24VDC		
V 11	12AU7	137VDC	0V.	8.2VDC	0V.	0V.	50VDC	0V.	5VDC	6.3VAC
V 12	6AU6	#0V.	#0V.	#0V.	#6.3VAC	#195VDC	#190VDC	#1.2VDC		
V 13	6AL5	#-.1VDC	#3.7VDC	#0V.	#6.3VAC	#5.3VDC	#0V.	#-.3VDC		
V 14	6AU6	#0V.	#0V.	#0V.	#6.3VAC	#17VDC	#47VDC	#1.2VDC		
V 15	6K6GT	0V.	#6.3VAC	#190VDC	#210VDC	#0V.	#0V.	#0V.	#12VDC	
V 16	6SN7GT	0V.	340VDC	5VDC 25VDC	-34VDC	75VDC 150VDC	0V.	6.3VAC	0V.	
V 17	6AL5	1.7VDC	-1.4VDC	6.3VAC	0V.	0V.	0V.	0V.		
V 18	6SN7GT	0V.	280VDC	10VDC	-4.9VDC	110VDC	10VDC	6.3VAC	0V.	
V 19	6BG6G	0V.	0V.	9VDC	0V.	-20VDC	0V.	6.3VAC	270VDC	TOP CAP
V 20	6W4GT	0V.	0V.	460VDC	0V.	385VDC	0V.	6.3VAC	0V.	
V 21	1B3GT	* DO NOT MEASURE								
V 22	5U4G	0V.	400VDC	0V.	400VAC	0V.	400VAC	0V.	400VDC	
V 23	10BP4	0V.	4.8VDC	PIN 10 380VDC	PIN 11 130VDC	PIN 12 6.3VAC				

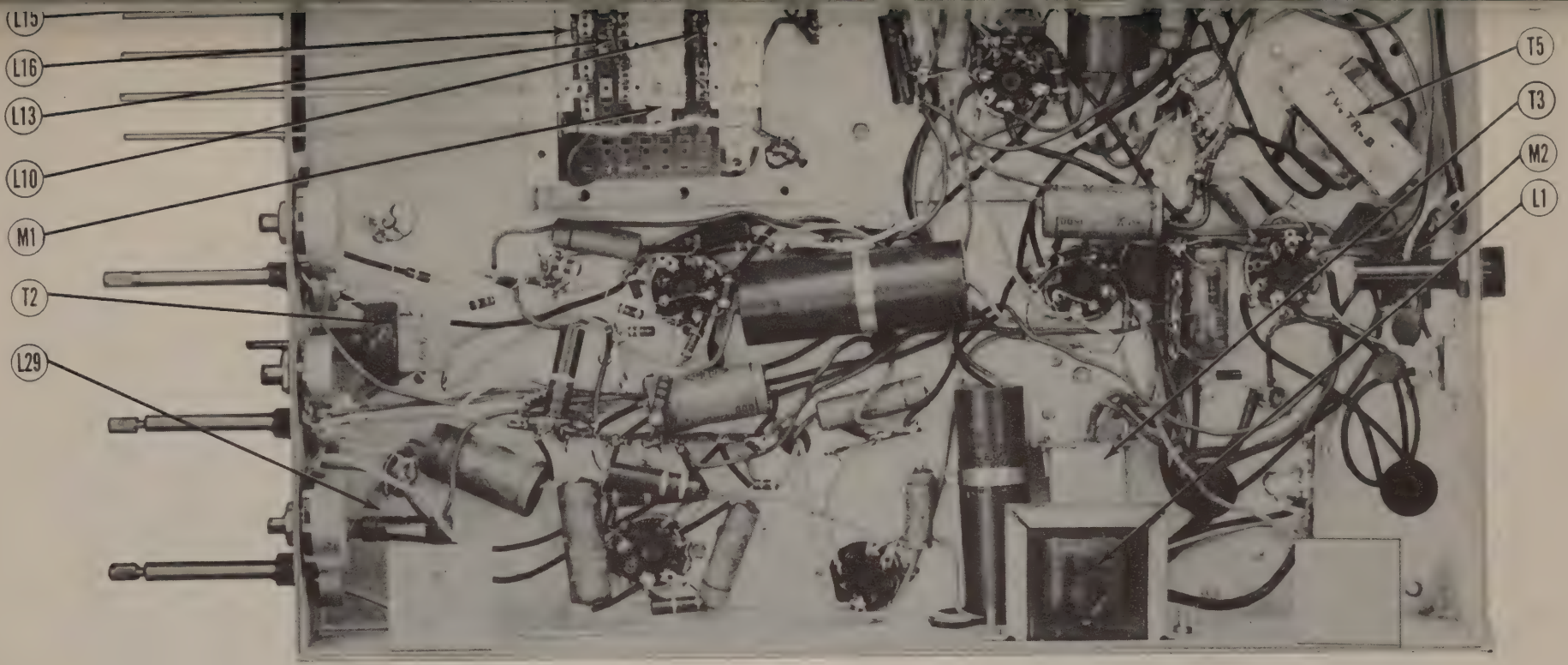
§ TAKEN WITH VACUUM TUBE VOLTMETER.
▲ MEASURED ON CHANNEL 13.
♦ MEASURED ON CHANNEL 6.
MEASURED FROM PIN 2 OF V14.
* DO NOT MEASURE.

RESISTANCE READINGS

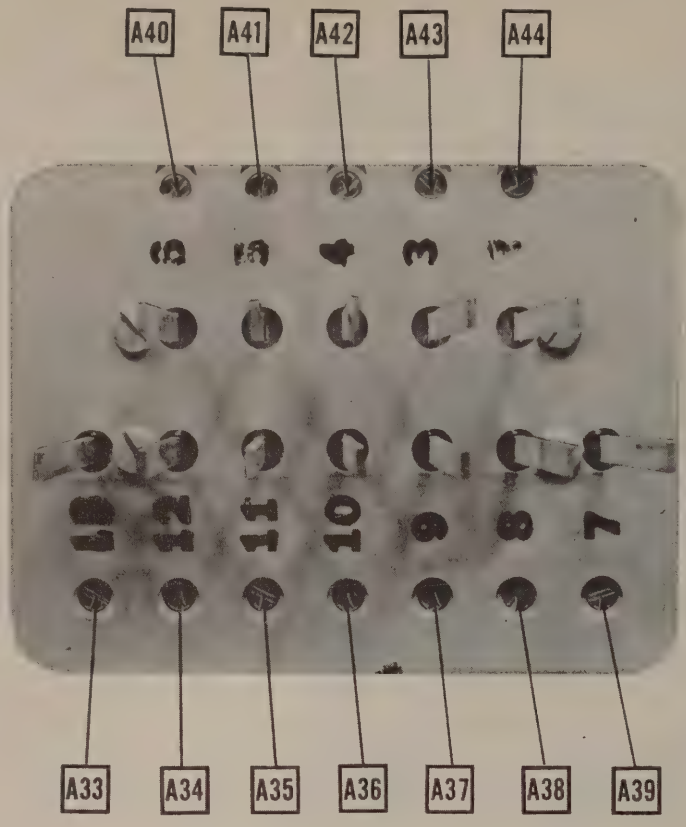
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2.4 Meg.	0Ω	.1Ω	0Ω	#1000Ω	†▲ 38KΩ	0Ω		
V 2	6AU6	2.3 Meg.	0Ω	.1Ω	0Ω	#1000Ω	†♦38KΩ	0Ω		
V 3	12AT7	#23KΩ	1.5 Meg.	0Ω	0Ω	0Ω	#23KΩ	1.5 Meg.	0Ω	.1Ω
V 4	12AT7	†50KΩ	10KΩ	1.5Ω	0Ω	0Ω	†50KΩ	10KΩ	1.5Ω	.1Ω
V 5	6AU6	2 Meg.	0Ω	0Ω	.1Ω	#2KΩ	#2KΩ	68Ω		
V 6	6AU6	2 Meg.	0Ω	0Ω	.1Ω	#2KΩ	#2KΩ	68Ω		
V 7	6AU6	2 Meg.	0Ω	0Ω	.1Ω	#2KΩ	#2KΩ	68Ω		
V 8	6AU6	33KΩ	0Ω	0Ω	.1Ω	#1000Ω	#1000Ω	220Ω		
V 9	6AL5	.1Ω	680KΩ	.1Ω	0Ω	5KΩ	0Ω	8.2KΩ		
V 10	6BA6	470KΩ	0Ω	0Ω	.1Ω	†8KΩ	#0Ω	1000Ω		
V 11	12AU7	#11KΩ	1 Meg.	4KΩ	0Ω	0Ω	47KΩ	4.7 Meg.	470KΩ	.1Ω
V 12	6AU6	#68KΩ	#0Ω	#0Ω	#.1Ω	†2KΩ	†2KΩ	#68Ω		
V 13	6AL5	#Inf.	#Inf.	#0Ω	#.1Ω	#6.8KΩ	0Ω	7.3KΩ		
V 14	6AU6	#0Ω	#0Ω	#0Ω	#.1Ω	†470KΩ	†1 Meg.	#470Ω		
V 15	6K6GT	Inf.	#.1Ω	†1.2KΩ	†750Ω	#470KΩ	#0Ω	#0Ω	#390Ω	
V 16	6SN7GT	2.2 Meg.	†9KΩ	§.5KΩ §00Ω	2 Meg.	†4 Meg. †1.5 Meg.	0Ω	.1Ω	0Ω	
V 17	6AL5	4.8 Meg.	4.8 Meg	.1Ω	0Ω	27KΩ	0Ω	27KΩ		
V 18	6SN7GT	5 Meg.	†38KΩ	1.5KΩ	120KΩ	¶350KΩ	1.5KΩ	.1Ω	0Ω	
V 19	6BG6G	Inf.	0Ω	82Ω	Inf.	1 Meg.	Inf.	.1Ω	†9KΩ	TOP CAP †8KΩ
V 20	6W4GT	Inf.	Inf.	†8KΩ	Inf.	†260Ω	Inf.	.1Ω	0Ω	
V 21	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †8KΩ
V 22	5U4G	Inf.	50KΩ	Inf.	42Ω	Inf.	40Ω	Inf.	50KΩ	
V 23	10BP4	0Ω	470KΩ	PIN 10 130KΩ	PIN 11 150KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V22.
# MEASURED FROM PIN 2 OF V14.
▲ MEASURED ON CHANNEL 13.
♦ MEASURED ON CHANNEL 6.
¶ MEASURED FROM PIN 3 OF V20.

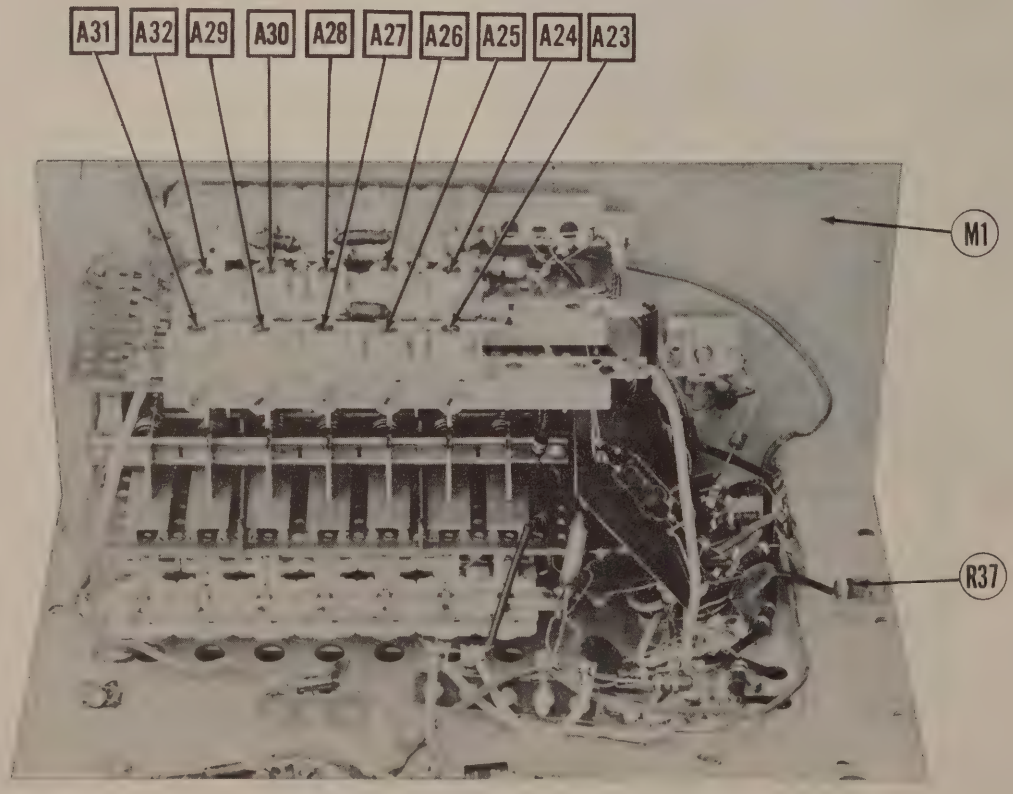
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



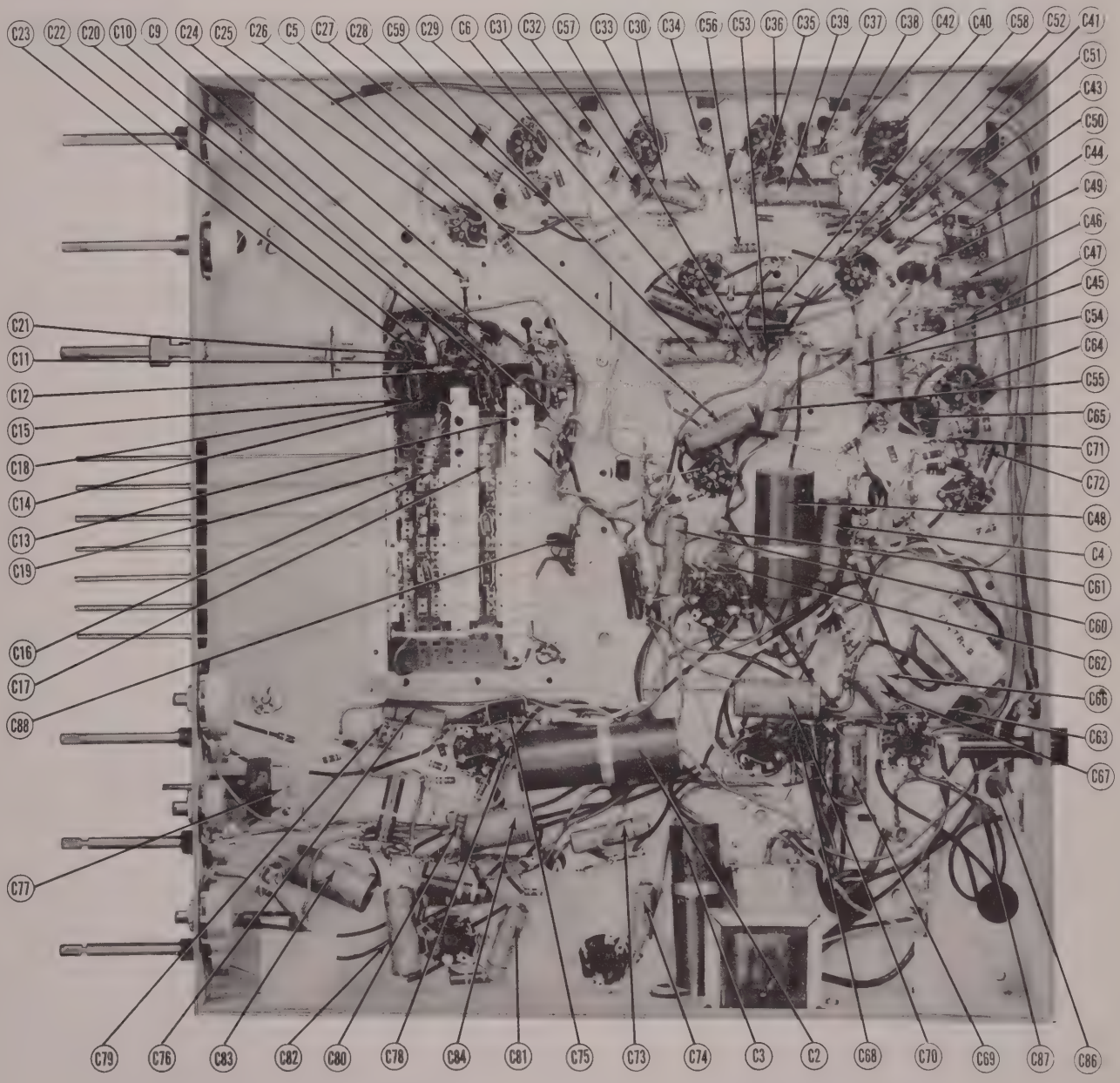
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



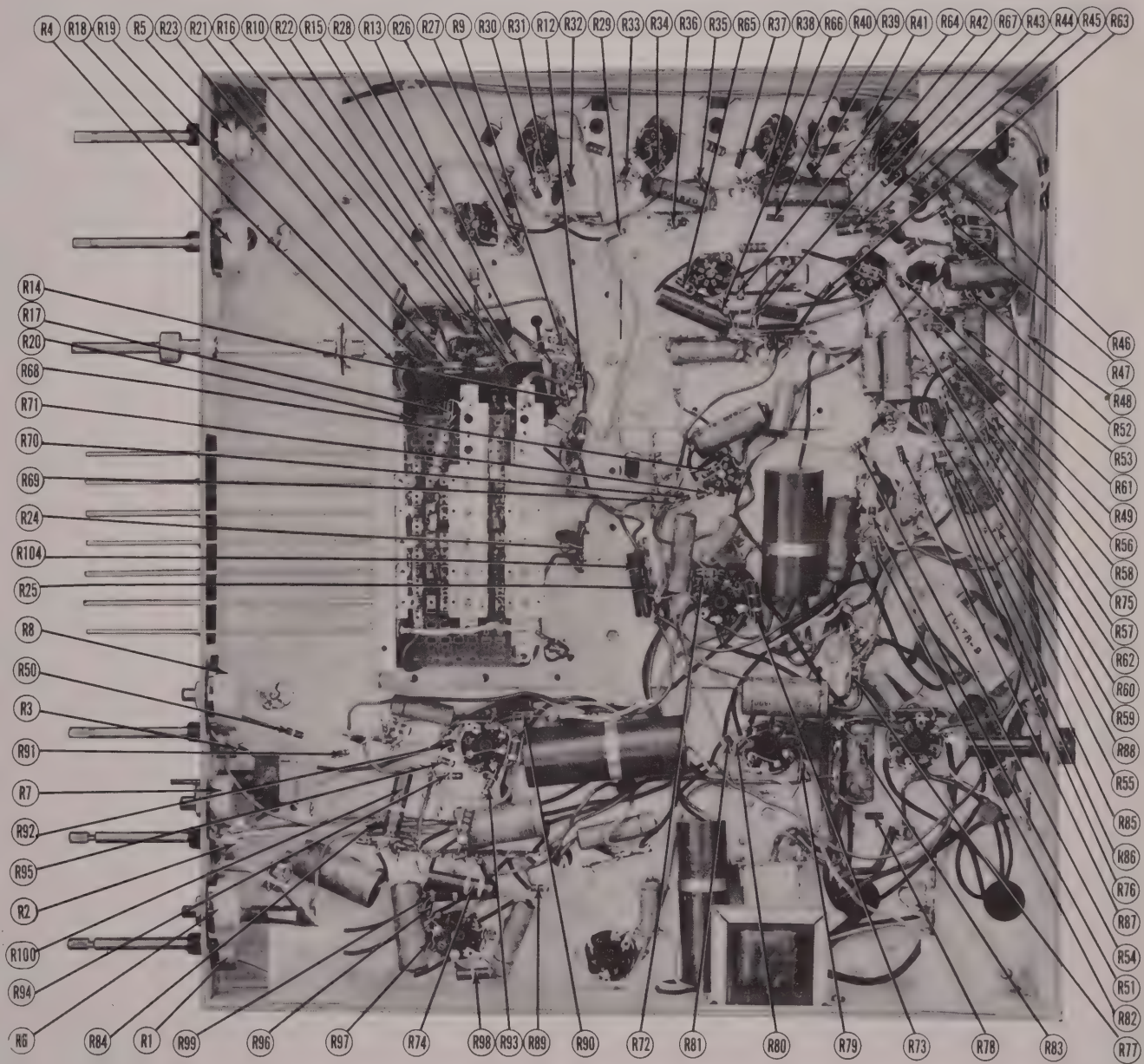
RF OSCILLATOR ALIGNMENT POINTS



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern and turn the contrast control maximum counter-clockwise.

Set the horizontal hold control 1/3 of a revolution clockwise from maximum counter-clockwise.

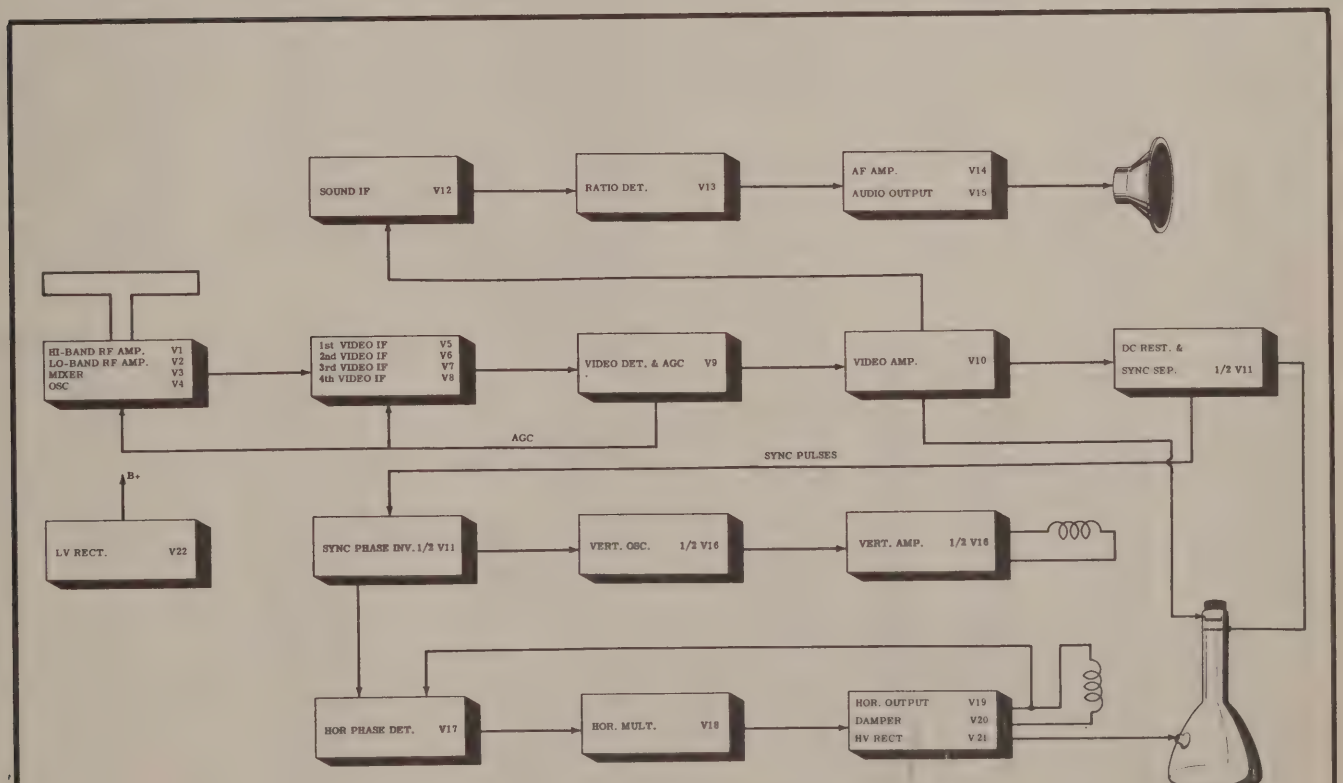
Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Check the setting of B1 by switching to another channel and back again; the picture should remain in sync. If it does not readjust B1 and repeat the check.

Adjust the horizontal drive trimmer (B2) for best compromise between brightness and horizontal linearity.

Adjust the horizontal size slug (B3) until picture fills the mask horizontally. (Slight readjustment of B2 may be necessary for best results.)

DISASSEMBLY INSTRUCTIONS

1. Remove six push-on type control knobs.
2. Remove three 1/4" hex head bolts and nine screws holding rear cover. Remove cover.
3. Remove two screws holding antenna terminal strip.
4. Disconnect speaker plug from rear of chassis.
5. Remove four 7/16" hex head bolts holding chassis. Remove chassis.
6. Remove four 1/4" hex head bolts holding speaker. Remove speaker.



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Hi-Band RF Amp.	6AG5	6AG5	7BD	
V2	Lo-Band RF Amp.	6AU6	6AU6	7BK	
V3	Mixer	12AT7	12AT7	9A	
V4	Oscillator	12AT7	12AT7	9A	
V5	1st Video IF	6AU6	6AU6	7BK	
V6	2nd Video IF	6AU6	6AU6	7BK	
V7	3rd Video IF	6AU6	6AU6	7BK	
V8	4th Video IF	6AU6	6AU6	7BK	
V9	Video Det.	6AL5	6AL5	6BT	
V10	Video Amp.	6BA6	6BA6	7BK	
V11	DC Restorer-Sync. Sep.-Phase Inv.	12AU7	12AU7	9A	
V12	Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Det.	6AL5	6AL5	6BT	
V14	AF Amp.	6AU6	6AU6	7BK	
V15	Audio Output	6K6GT	6K6GT	7S	
V16	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V17	Hor. Phase Det.	6AL5	6AL5	6BT	
V18	Hor. Multivibrator	6SN7GT	6SN7GT	8BD	
V19	Hor. Output	6BG6G	6BG6G	5BT	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
V23A	Picture Tube	10BP4	10BP4	12D	
B	Picture Tube	12LP4	12LP4	12D	
C	Picture Tube	16AP4	16AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	TV-EC-16	AFH88J	UP4445		TVL-84	▲ Filter
B	40	450						▲ Filter
C2A	40	450	TV-EC-19	PRS450/40-20	UP43145C §		TVL-36♦	Filter-Red
B	20	450		PRS450/10				Decoupling-Green
C	10	450						Vert. Osc. Plate Dec.-Blue
C3A	40	450	TV-EC-17	PRS450/40	BR4045		TVA-24	Filter-Red
B	50	50		PR350/50	BR505		TVA-16	Output Cath. Byp.-Green
C4A	10	450	TV-EC-18	AF82J16D♦				Vert. Output Dec.-Red
B	50	150						Decoupling-Green
C	100	25						Vert. Output Cath. Bypass-Blue
C5	70	10	TV-EC-6	PRS25/100	BRH121		UHC-112	Output Cath. Bypass
C6	10	50	TV-EC-20	PRS50/10	BR105		TVA-14	Stabilizing Cap.
C7	1000		TV-CC-2			GP2L-001	29C4	RF Coupling
C8	1000		TV-CC-2			GP2L-001	29C4	RF Coupling
C9A	1000		TV-CC-2			GP2L-001	29C7	RF Screen Bypass
B	1000		TV-CC-2			GP2L-001		Filament Bypass
C10A	1000		TV-CC-1			GP2L-001	29C7	RF Screen Bypass
B	1000					GP2L-001		RF Bypass
C11	.5		TV-CC-18					RF Coupling
C12	.68		TV-CC-17					RF Coupling
C13	1500		TV-CC-20			GP2L-0015		RF Coupling
C14	1500		TV-CC-20			GP2L-0015		RF Coupling
C15	1500		TV-CC-20			GP2L-0015	29C3	RF Bypass *
C16	1500		TV-CC-20			GP2L-0015		RF Coupling
C17	1500		TV-CC-20			GP2L-0015		RF Coupling
C18	47		TV-CC-12			GP1K-47		Osc. Grid Cap.
C19	47		TV-CC-12			GP1K-47		Osc. Grid Cap.
C20	.68		TV-CC-17					Osc. Coupling
C21	3.3		TV-CC-19			NPOK-3.3		Osc. Feedback
C22	2.2		TV-CC-16					Osc. Feedback
C23A	1000		TV-CC-1			GP2L-001	29C7	Osc. Plate Bypass
B	1000					GP2L-001		Osc. Plate Bypass
C24	47		TV-CC-13	1468-00005	5W5Q5	GP1K-47	1FM-45	IF Coupling
C25	1000		TV-CC-2	1468-001	IW5D1	GP2L-001	29C4	AGC Filter
C26A	1000		TV-CC-1	1468-001	IW5D1	GP2L-001	29C7	1st V. IF Fil. Bypass
B	1000			1468-001	IW5D1	GP2L-001		1st V. IF Decoupling
C27	100		TV-CC-5	1468-0001	5W5T1	GP1K-100	1FM-31	IF Coupling
C28	1000		TV-CC-2	1468-001	IW5D1	GP2L-001	29C4	AGC Filter
C29A	1000		TV-CC-1	1468-001	IW5D1	GP2L-001	29C7	2nd V. IF Fil. Bypass
B	1000			1468-001	IW5D1	GP2L-001		2nd V. IF Decoupling
C30	.05	200	TV-PC-5	P288-05	GT285		TM-15	Decoupling
C31	100		TV-CC-5	1468-0001	5W5T1	GP1K-100	1FM-31	IF Coupling
C32	1000		TV-CC-2	1468-001	IW5D1	GP2L-001	29C4	AGC Filter
C33A	1000		TV-CC-1	1468-001	IW5D1	GP2L-001	29C7	3rd V. IF Fil. Bypass
B	1000			1468-001	IW5D1	GP2L-001		3rd V. IF Decoupling
C34	100		TV-CC-5	1468-0001	5W5T1	GP1K-100	1FM-31	IF Coupling
C35	1000		TV-CC-2	1468-001	IW5D1	GP2L-001	29C4	4th V. IF Cath. Bypass
C36A	1000		TV-CC-1	1468-001	IW5D1	GP2L-001	29C7	4th V. IF Fil. Bypass
B	1000			1468-001	IW5D1	GP2L-001		4th V. IF Decoupling
C37	100		TV-CC-5	1468-0001	5W5T1	GP1K-100	1FM-31	IF Coupling
C38	100		TV-CC-5	1468-0001	5W5T1	GP1K-100	1FM-31	IF Coupling
C39	.25	200	TV-PC-4	P488-25	GT2P25		TC-2	AGC Filter
C40A	1000		TV-CC-1	1468-001	IW5D1	GP2L-001	29C7	AGC Filter
B	1000			1468-001	IW5D1	GP2L-001		V. DET.-AGC Fil. Bypass
C41	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	DAGC Decoupling
C42	4.7		TV-CC-15	1468-000005	5W5V5	NPOK-5	MS-55	V. Diode Filter
C43	.25	600	TV-PC-4	684-25	GT6P25		TC-2	Video Coupling
C44	330		TV-CC-8	1468-00035	5W5T3	GP2K-330	1FM-335	V. Amp. Cath. Bypass
C45	.1	600	TV-PC-16	P688-1	GT6P1		TM-1	Pic. Tube Cath. Dec.
C46	.1	600	TV-PC-16	P688-1	GT6P1		TM-1	Video Coupling
C47	.01	600	TV-PC-15	P688-01	GT6S1	GP2-335-01	TM-11	Video Coupling
C48	.25	200	TV-PC-4	P488-25	GT2P25		TC-2	DC Rest. Cath. Bypass
C49	I		TV-CC-14					S. IF Coupling
C50	33		TV-CC-6	1468-00004	5W5Q4	GP1K-33	1FM-44	S. IF Coupling
C51	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	S. IF Cath. Bypass
C52	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	S. IF Decoupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C53	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	RF Bypass
C54	.02	600	TV-PC-14	P888-02	GT6S2		TM-12	RF Bypass
C55	.02	600	TV-PC-14	P888-02	GT6S2		TM-12	RF Bypass
C56	1000		TV-CC-7	1468-001	IW5D1	GP2L-001	1FM-21	Diode Load Cap.
C57	47		TV-CC-13	1468-00005	5W5Q5	GP1K-47	1FM-45	RF Bypass
C58	2200	500	TV-MC-11	1467-002	IW5D2	GP2M-0022	1FM-22	De-emphasis
C59	.05	400	TV-PC-5	P488-05	GT485		TM-15	Audio Coupling
C60	.05	600	TV-PC-5	P888-05	GT6S5		TM-15	AF Screen Bypass
C61	.02	600	TV-PC-14	P888-02	GT6S2		TM-12	Audio Coupling
C62	100	500	TV-MC-2	1468-0001	5W5T1	GP1K-100	1FM-31	Output Grid Bypass
C63	5000	500	TV-MC-10	1467-005	ID5D5	GP2M-005	1FM-25	Output Plate Bypass
C64	10000		TV-CC-4	P888-01	GT6S1	821-01	36C1	Sync. Coupling
C65	2200	500	TV-MC-11	1467-002	IW5D2	GP2M-0022	1FM-22	Integrator Net.
C66	4700	500	TV-MC-10	1467-005	ID5D5	GP2M-0047	1FM-25	Integrator Net.
C67	4700	500	TV-MC-10	1467-005	ID5D5	GP2M-0047	1FM-25	Integrator Net.
C68	5000	500	TV-MC-10	1467-005	ID5D5	GP2M-005	1FM-25	Vert. Osc. Grid Cap.
C69	.1	600	TV-PC-16	P688-1	GT6P1		TM-1	Vert. Discharge
C70	.25	600	TV-PC-17	684-25	GT6P25		TC-2	Vert. Sweep Coupling
C71	1000		TV-CC-7	1468-001	IW5D1	GP2L-001	1FM-31	Hor. Sync. Coupling
C72	1000		TV-CC-7	1468-001	IW5D1	GP2L-001	1FM-31	Hor. Sy nc. Coupling
C73	.05	600	TV-PC-13	P688-05	GT6S5		TM-15	AFC Feedback
C74	.01	600	TV-PC-15	P688-01	GT6S1	GP2-335-01	TM-11	AFC Filter
C75	5000	500	TV-MC-10	1467-005	ID5D5	GP2M-005	1FM-25	AFC Filter
C76	.05	200	TV-PC-5	P288-05	GT285		TM-15	AFC Filter
C77	3900	500	TV-MC-13					Fixed Trimmer
C78	330		TV-MC-13	1468-00035	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C79	390		TV-MC-14	1468-0004	5W5T4	GP2K-390	1FM-34	Hor. Discharge
C80	1000		TV-CC-7	1468-001	IW5D1	GP2L-001	1FM-21	Hor. Sweep Coupling
C81	.05	600	TV-PC-13	P688-05	GT6S5		TM-15	Hor. Output Screen Bypass
C82	.25	200	TV-PC-4	P488-25	GT2P25		TC-2	Hor. Output Cath. Bypass
C83	.25	600	TV-PC-17	684-25	GT6P25		TC-2	Damper Filter
C84	.25	800	TV-PC-17	684-25	GT6P25		TC-2	Hor. Sweep Coupling
C85	500	10000	TV-CC-13					HV Filter
C86	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	Line Filter
C87	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	Line Filter
C88	5000		TV-CC-3	1467-005	ID5D5	811-005	29C1	RF Bypass †

* Some models use 1000MMF in this application.
§ Omit bypass section
♦ Use clamp mounting
† Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	TV-VC-22	QII-137	AM-61-S	Vert. hold control
B	Shaft		Not. Req.	Not Req.	KSS-3	Attach to R1A per instructions
R2A	50KΩ	½	TV-VC-23	QII-123	AM-44-S	Horiz. hold control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R2A per instructions
R3A	100KΩ	½	TV-VC-24	QII-128	AM-49-S	Brightness control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R3A per instructions
R4	1000Ω	2	TV-VC-25			Contrast control- Wire Wound
R5A	250KΩ	½	TV-VC-26	QI3-130	AM-64-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R5A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R5A per instructions
R6	1500Ω	4	TV-VC-27			Focus control-Wire Wound
R7A	2.5 Meg.	½	TV-VC-28	QII-239	AM-84-S	Height control
B	Shaft		Not Req.	SQ	KSS-3	Attach to R7A per instructions
R8	5000Ω	2	TV-VC-29	W-5000 *	58-5000*	Vert. linearity control-Wire Wound

* File shaft to duplicate original.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	100KΩ	½	TV-IR-43		High Band RF Grid
R10	4700Ω	½	TV-IR-48		High Band RF Screen
R11	10KΩ	½	TV-IR-64		High Band RF Plate See Note 1
R12	470KΩ	½	TV-IR-11		AGC Network
R13	4700Ω	½	TV-IR-48		Low Band RF Screen
R14	10KΩ	½	TV-IR-64		Low Band RF Plate
R15	2.2 Meg.	½	TV-IR-13		High Band Mixer Grid
R16	22KΩ	½	TV-IR-45		High Band Mixer Plate
R17	2.2 Meg.	½	TV-IR-13		Low Band Mixer Grid
R18	10KΩ	½	TV-IR-64		High Band Osc. Grid
R19	15KΩ	½	TV-IR-63		High Band Osc. Plate
R20	10KΩ	½	TV-IR-64		Low Band Osc. Grid
R21	15KΩ	½	TV-IR-63		Low Band Osc. Plate
R22	100KΩ	½	TV-IR-43		Series Test Point
R23	100KΩ	½	TV-IR-43		Series Test Point
R24	1000Ω 20%	½	TV-IR-24	BTS-1000	Decoupling
R25	1000Ω 20%	½	TV-IR-24	BTS-1000	Decoupling
R26	68Ω	½	TV-IR-59		1st Video IF Cathode
R27	1000Ω 20%	½	TV-IR-24	BTS-1000	1st Video IF Decoupling
R28	100KΩ	½	TV-IR-43	BTS-100K	AGC Network
R29	100KΩ	½	TV-IR-43	BTS-100K	AGC Network
R30	22KΩ	½	TV-IR-45		2nd Video IF Grid
R31	68Ω	½	TV-IR-59		2nd Video IF Cathode
R32	1000Ω 20%	½	TV-IR-24	BTS-1000	2nd Video IF Decoupling
R33	22KΩ	½	TV-IR-45	BTS-22K	3rd Video IF Grid
R34	68Ω	½	TV-IR-59		3rd Video IF Cathode
R35	1000Ω 20%	½	TV-IR-24	BTS-1000	3rd Video IF Decoupling
R36	100KΩ	½	TV-IR-43	BTS-100K	AGC Network
R37	33KΩ	½	TV-IR-58		4th Video IF Grid
R38	220Ω	½	TV-IR-5		4th Video IF Cathode
R39	1000Ω 20%	½	TV-IR-24	BTS-1000	4th Video IF Decoupling
R40	1000Ω 20%	½	TV-IR-24	BTS-1000	Decoupling

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R41	680KΩ	½	TV-IR-26	BTS-680K	AGC Rect. Load
R42	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	AGC Network
R43	4700Ω	½	TV-IR-48	BTS-4700	Voltage Divider
R44	33KΩ	1		BTA-33K	Voltage Divider
R45	820KΩ	½	TV-IR-60	BTS-8200	Video Det. Diode Load
R46	470KΩ 20%	½	TV-IR-11	BTS-470K	Video Amp. Grid
R47	68Ω	½	TV-IR-59	BW-½-68	Video Amp. Cathode
R48	6800Ω	5	WR-8	AB-7000	Video Amp. Plate-Wire Wound
R49	68KΩ	½	TV-IR-61	BTS-68K	Voltage Divider
R50	220KΩ 20%	½	TV-IR-30	BTS-220K	Voltage Divider
R51	100KΩ	½	TV-IR-43	BTS-100K	Acc. Anode Load
R52	47KΩ	½	TV-IR-46	BTS-47K	Sync. Coupling Network
R53	4.7 Meg. 20%	½	TV-IR-44	BTS-4.7 Meg.	Sync. Sep. Grid
R54	470KΩ 20%	½	TV-IR-11	BTS-470K	Picture Tube Grid
R55	100KΩ	½	TV-IR-43	BTS-100K	Sync. Sep. Plate
R56	47KΩ	½	TV-IR-46	BTS-47K	Voltage Divider
R57	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	Sync. Phase Inv. Grid
R58	3900Ω	½	TV-IR-22	BTS-3900	Sync. Phase Inv. Plate
R59	6800Ω	½	TV-IR-78	BTS-6800	Sync. Phase Inv. Plate See Note 3
R60	3900Ω	½	TV-IR-22	BTS-3900	Sync. Phase Inv. Cathode
R61	68KΩ	½	TV-IR-61		Sound IF Grid
R62	68Ω	½	TV-IR-59		Sound IF Cathode
R63	1000Ω 20%	½	TV-IR-24	BTS-1000	Sound IF Decoupling
R64	470Ω	½	TV-IR-6	BTS-470	Balancing
R65	6800Ω	½	TV-IR-78	BTS-6800	Ratio Det. Diode Load
R66	6800Ω	½	TV-IR-78	BTS-6800	Ratio Det. Diode Load
R67	33KΩ	½	TV-IR-58	BTS-33K	De-emphasis
R68	470Ω	½	TV-IR-6	BTS-470	AF Cathode
R69	100KΩ	½	TV-IR-43	BTS-100K	Voltage Divider
R70	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	AF Screen
R71	470KΩ 20%	½	TV-IR-11	BTS-470K	AF Plate
R72	470KΩ 20%	½	TV-IR-11	BTS-470K	Output Grid
R73	390Ω	1	TV-IR-55	BTA-390	Output Cathode
R74	390Ω	2	TV-IR-56	BW-2-390	Filter
R75	22KΩ	½	TV-IR-45	BTS-22K	Integrator
R76	8200Ω	½	TV-IR-60	BTS-8200	Integrator
R77	8200Ω	½	TV-IR-60	BTS-8200	Integrator
R78	2200Ω 20%	½	TV-IR-15	BTS-2200	Vert. Peaking
R79	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	Vert. Osc. Grid
R80	560Ω	½	TV-IR-49	BTS-560	Vert. Output Cathode
R81	2.2 Meg. 20%	½	TV-IR-13	BTS-2.2 Meg.	Vert. Output Grid
R82	6800Ω	½	TV-IR-78	BTS-6800	Vert. Output Plate Decoupling
R83	1.5 Meg. 20%	½	TV-IR-47	BTS-1.5 Meg.	Vert. Osc. Plate
R84	47KΩ	½	TV-IR-46	BTS-47K	Vert. Osc. Plate Decoupling
R85	100KΩ	½	TV-IR-43	BTS-100K	Horiz. Phase Det. Load
R86	100KΩ	½	TV-IR-43	BTS-100K	Horiz. Phase Det. Load
R87	4.7 Meg. 20%	½	TV-IR-44	BTS-4.7 Meg.	Horiz. Phase Det. Load
R88	27KΩ	½	TV-IR-62	BTS-27K	Feedback Network
R89	6800Ω	½	TV-IR-78	BTS-6800	Feedback Network
R90	470KΩ 20%	½	TV-IR-11	BTS-470K	Horiz. AFC Filter Network
R91	5600Ω	½	TV-IR-52	BTS-5600	Horiz. MV Plate
R92	1500Ω	½	TV-IR-29	BTS-1500	Horiz. MV Cathode
R93	68KΩ	½	TV-IR-61	BTS-68K	Horiz. MV Grid
R94	330KΩ	½	TV-IR-51	BTS-330K	Horiz. MV Plate
R95	4700Ω	½	TV-IR-48	BTS-4700	Horiz. Peaking
R96	33Ω 20%	½	TV-IR-17		Parasitic Supp.
R97	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	Horiz. Output Grid
R98	82Ω	1	TV-IR-54	BW-1-82	Horiz. Output Cathode
R99	8200Ω	2	TV-IR-53	BT-2-8200	Horiz. Output Screen
R100	22KΩ	2	TV-IR-50	BT-2-22K	Filter
R101	10KΩ	25	TV-WR-9		Damper Filter-Wire Wound-See Note 2
R102	3.3Ω	½	TV-IR-65		HV Rect. Filament
R103	1 Meg.	1	TV-IR-66		HV Filter
R104	33KΩ	2	TV-IR-57	BT-2-33K	Voltage Dropping

Note 1. Not used in all models.
Note 2. Tapped at 2000Ω, 6000Ω and 9000Ω
Note 3. Some models use 5600Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.8Ω	TV-SPK-15	ST-810 † MOD. P69-V	69A3 †	† Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	6" x 8 7/8"	3/4"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC at 1.7A	775VCT .180ADC SEC. 4 6.3VAC at 1.3A	5VAC at 3A	6.3VAC at 7.4A	TV-TR-1		P-3059 §	

§ Mount vertically with universal mounting brackets.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	90Ω		TV-L-18				Hor. Sync. Coil
T3	175Ω	1400Ω	TV-TR-3	A-8121 †	A-4000 †	TBO-2	Vert. Block Osc. Trans.
T4	450Ω	SEC. 1 10.5Ω Tap at .7Ω SEC. 2 0Ω	TV-TR-4	A-8117		TFB-1	Hor. Output Trans.
T5	1000Ω	12Ω	TV-TR-2	A-8115 †	A-3035 †	TSO-5 †	Vert. Output Trans.
T6A	14Ω		TV-L-25	DY-1			Hor. Deflection Coil
B	62Ω						Vert. Deflection Coil
T7	245Ω		TV-L-24	FC-10			Focus Coil

† Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T8	11KΩ	3.8Ω	620Ω	.3Ω		A-2313	A-2904 #	RO-301	# Drill one new mounting hole.

FILTER CHOKE

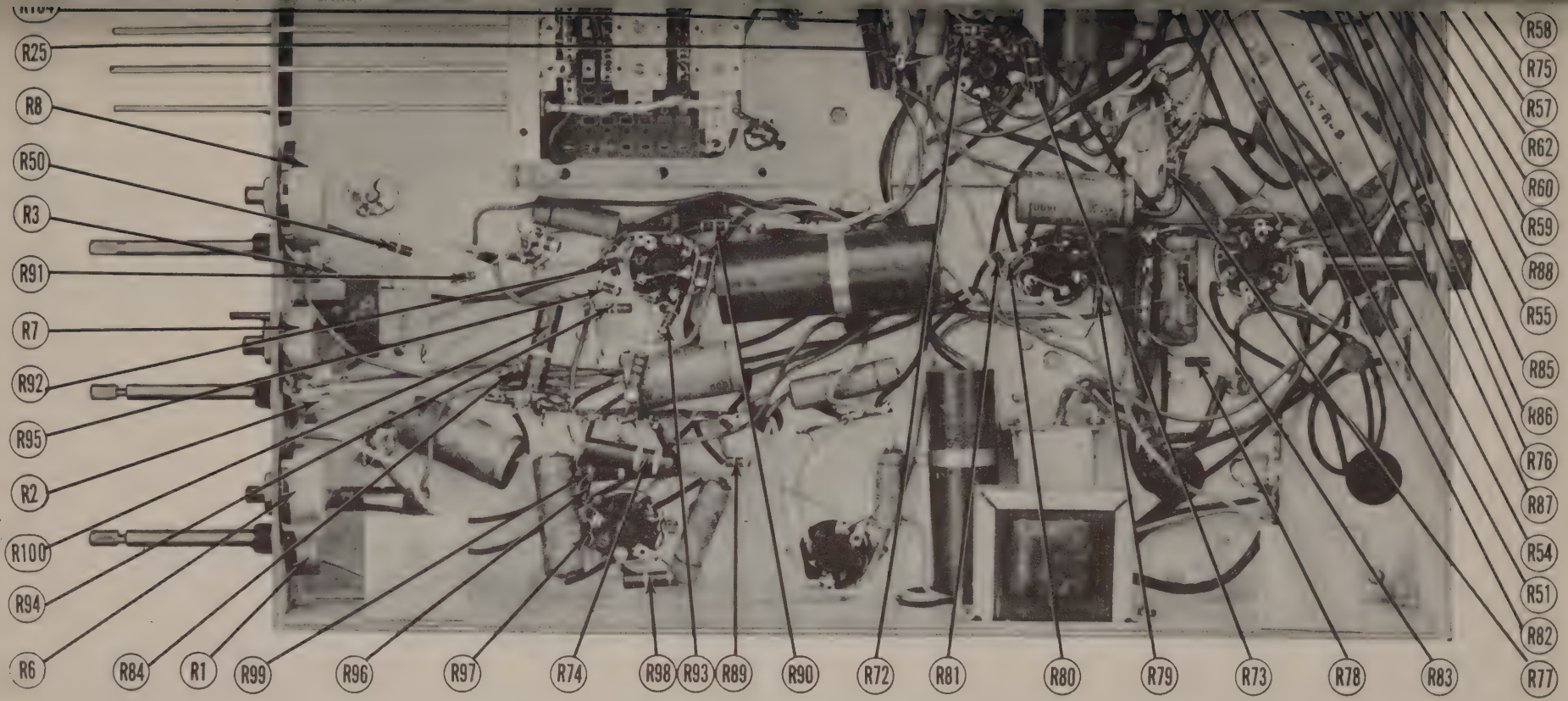
ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.180A	60Ω	2.6 Henries	TV-FC-1	C-2325	C-2974	TR-4200	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRAV-LER PART No.	MEISSNER PART No.	
L2	Ant. Input Trans.	0Ω		TV-L-23		
L3	RF Plate	0Ω				High Band
L4	RF Choke	3.8Ω		TV-L-21		
L5	Mixer Grid	0Ω				High Band Short length of straight, bare wire.
L6	Osc. Grid	0Ω				High Band Short length of straight, bare wire.
L7	RF Choke	1.8Ω		TV-L-20		
L8	RF Plate	.1Ω				Low Band
L9	RF Plate	.1Ω				Low Band
L10	RF Plate	.1Ω				Low Band
L11	Mixer Grid	.1Ω				Low Band
L12	Mixer Grid	.1Ω				Low Band
L13	Mixer Grid	.1Ω				Low Band
L14	Osc. Grid	.1Ω				Low Band
L15	Osc. Grid	.1Ω				Low Band
L16	Osc. Grid	.1Ω				Low Band
L17	RF Choke	1.5Ω		TV-L-21		
L18	RF Choke	1.5Ω		TV-L-21		
L19	1st Video IF	.1Ω		TV-L-13		
L20	2nd Video IF	.1Ω		TV-L-13		
L21	3rd Video IF	.1Ω		TV-L-13		
L22	4th Video IF	.1Ω		TV-L-13		
L23	RF Choke	3.2Ω		TV-L-20		
L24	5th Video IF	.1Ω		TV-L-13		
L25	Peaking	5Ω		TV-L-14		
L26	Peaking	7.2Ω		TV-L-15		
L27	Sound IF	2Ω		TV-L-16		
L28	Ratio Det. Trans.	5Ω	2.2Ω	TV-L-17		
L29	Width Cont.	.2Ω		TV-L-19		
L30	Fil. Choke	0Ω				
L31	Fil. Choke	0Ω				
L32	Fil. Choke	0Ω				
L33	Fil. Choke	0Ω				
L34	Fil. Choke	0Ω				

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M1	RF Tuner		
M2	Fuse		.25A
M3	Ion Trap		



CHASSIS BOTTOM VIEW- RESISTOR IDENTIFICATION

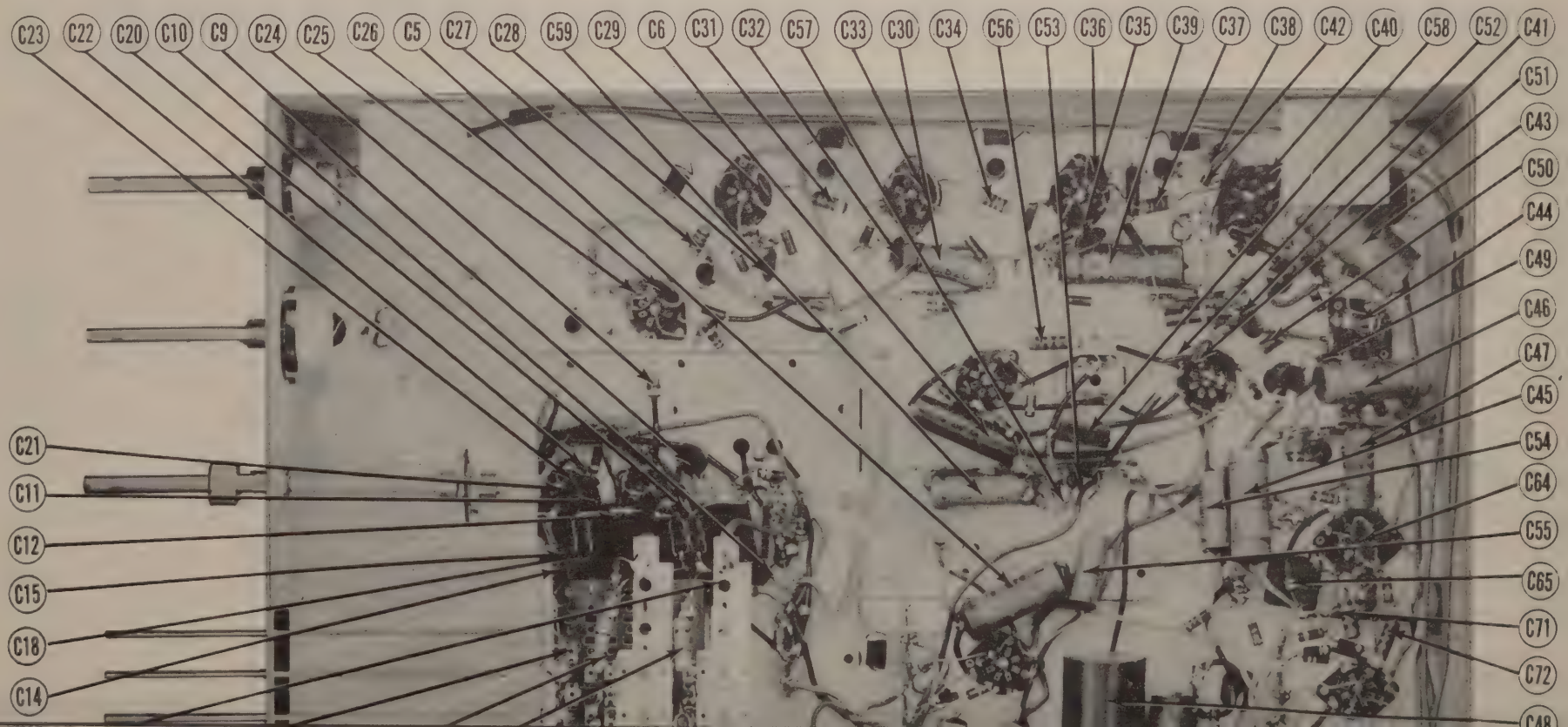

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FIG. 1—TOP VIEW

GENERAL INFORMATION

The Webster Model 148 is a single-post changer, designed to play automatically up to ten 12-inch or twelve 10-inch records, not intermixed. The last record will be repeated until the control knob is returned to the "Stop" position. Manual operation is provided for playing nonstandard and home recordings.

The changer is designed to operate from a supply of 105-125 volts AC, at 60 cycles; however, if it is desired to operate the changer on 50-cycle current, a special motor pulley (Part No. 17X412-11) must be used in place of the one supplied with the changer in order to drive the turntable at the required speed of 78 R.P.M.

Manufactured by: **WEBSTER-CHICAGO CORPORATION**
5610 Bloomingdale Avenue • Chicago 39, Illinois

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MODEL 148
WEBSTER
MODEL 148
WEBSTER

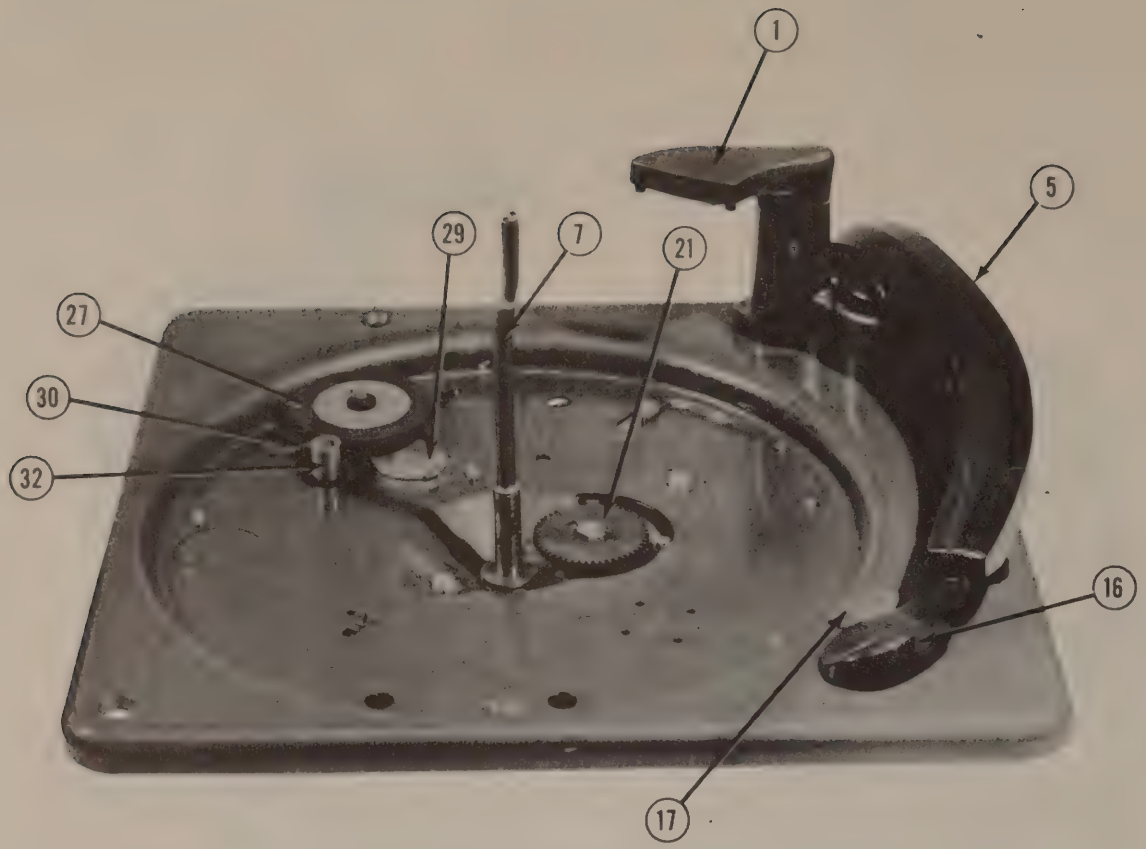

FIG. 2—TOP VIEW LESS TURNTABLE

AUTOMATIC OPERATION

1. Raise the record ballast weight (1) and rotate it outward until the pin in the shaft drops into the locating groove.

2. Push the record shelf (3) forward to its location for 10-inch records, or backward for 12-inch records.

3. Place up to ten 12-inch records, or twelve 10-inch records, on the spindle step, allowing them to come to a rest on the record shelf (3).

4. Turn the ballast weight (1) in and lower it to the records.

5. Move the control knob (16) to the "Start-Reject" position. This is done by moving the knob away from the arm rest (15). When the control knob is released, it will drop back into the automatic playing position. The changer will now play the entire stack of records, repeating the last record until the mechanism is turned off.

6. To reject any record while playing, move the control knob to the "Start-Reject" position and release.

7. To shut the changer off, move the control knob (16) to the "Stop" position and place the pickup arm on the arm rest (15). *This should be done when the changer is playing the record . . . not during the change cycle.*

Removing Records from the Turntable

1. Raise the ballast weight (1) and rotate it outward until the pin in the shaft drops into the locating groove.

2. Lift the stack of records straight up the spindle.

MANUAL OPERATION

1. Raise the record ballast weight (1) and move it outward until the pin in the shaft drops into the locating groove.

2. Turn the record shelf (3) to the 12-inch position. This is not necessary but permits more clearance in loading and unloading records.

3. Place a record on the turntable.

4. Move the control knob (16) to the "Start" position, then forward to the "Manual" position.

No harm will result if the control knob is accidentally moved to the "Start-Reject" position. If a twelve-inch record is on the turntable, the arm will automatically index to the edge of the record. If a 10-inch record is on the turntable, the needle will be set down gently on the rubber pad and the arm may be moved to the edge of the record.

5. Place the needle gently on the starting groove of the record.

6. To stop the mechanism at any time, move the control knob to the "Stop" position.

CHANGE CYCLE

As the pickup arm moves toward the center of the record, it moves the automatic trip arm (46) with it. The automatic trip arm is moved through the clutch weight (45) and the raising disc (55), which is fastened to the pivot shaft (11), as the trip arm (46) gradually approaches the velocity trip lever (64) and, upon contact, carries it with it. However, the main cam actuating gear (60) has four equally spaced projections on its circumference which strike the velocity trip lever roller as the gear revolves. This forces the automatic trip arm (46) and the velocity trip back away from the tripping point. This does not affect the pickup arm because of the friction clutch. When the needle enters the eccentric groove, upon completion of the record, the automatic trip arm (46) moves at such a speed that it carries the velocity trip lever (64) to the tripping point between projections on the main gear. This releases the actuating pawl on the main cam assembly (65), allowing it to engage the main cam actuating gear (60) and driving it through the change cycle.

The main cam (65) has two cam surfaces on its lower side. The inside cam surface forms a track in which the stud of the pickup raising lever (67) rides. The outer cam surface actuates the cam lever (43) by means of the cam lever roller. As the cam rotates, the pickup arm raising lever pushes up on the raising disc (55) raising the pickup arm from the record. The stud of the raising lever is now moved toward the center of the cam. As the raising lever moves, it engages a notch in the raising disc (55), moving the pickup arm out clear of the record stack. As the cam continues to rotate, the roller of the cam lever (43) moves up the incline

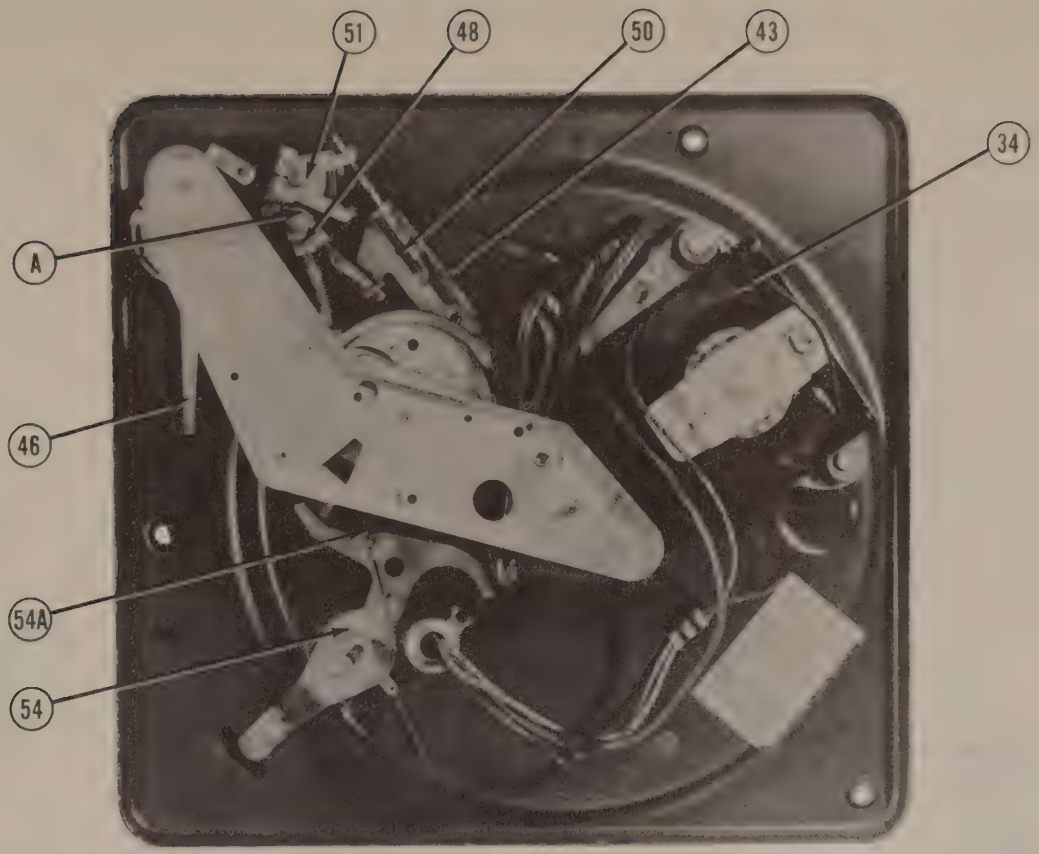

FIG. 3—BOTTOM VIEW

of the cam, causing the arm of the lever (43) to engage and actuate the push-off blade finger (51), which, in turn, rotates the push-off blade (2) toward the spindle to drop a record.

The stud on the raising lever now moves back away from the center of the cam, moving the pickup arm in to the set-down position. This position is determined by the selector lever compression spring (52). When the record shelf (3) is turned to the 10-inch position, pressure is applied by this spring to cause the raising lever stud (67) to follow the outer edge of its groove in the main cam. With the record shelf in the 12-inch position, the spring is relaxed and the stud follows the inner edge of its groove. The stud now moves up an incline, allowing the pickup to come down on the record. At the same time, the roller on the cam lever moves back up its incline, allowing the push-off blade to move back to normal position.

During the rotation of the cam, the velocity trip lever (64) has been reset by the projections on the main gear (60). Therefore, when the cam has completed one revolution, the hook on the velocity trip lever catches the cam pawl and disengages the main cam from the cam actuating gear, completing the cycle.

ADJUSTMENTS

Pickup Arm Height

The needle should clear the top record of a full stack of 10-inch records on the turntable by approximately 1/16". Adjustment may be made by bending the raising lever (67) at point (X), Fig. (4). Do not attempt to adjust by moving the raising disc (55).

CAUTION: All adjusting bends should be made slowly, using slight, but firm, easy pressure. Be sure the set screws in the raising disc (55) are not loose and are properly positioned in the alignment holes, as explained in the paragraph on "Set-Down Adjustment."

Set-Down Adjustment

Normally, the set-down point may be adjusted by turning the eccentric pin in the hinge (6). This pin is turned with a screwdriver and is reached through a hole in the top of the pickup arm. By turning the screw clockwise, the set-down point is moved toward the spindle, and counterclockwise to index the needle out away from the spindle. However, if this adjustment does not correct the landing point of the needle, the following procedure is necessary in order to obtain correct landing:

1. Set the eccentric screw to a central position.
2. Set the record shelf (3) to the 10-inch position.
3. With the power plug out, trip the mechanism by moving the control knob to "Reject." Rotate the turntable (by hand), clockwise, until the needle drops to within ⅛" of a 10-inch record.
4. Be sure the notch in the raising disc (55) engages the raising lever (67).
5. The No. 8 Bristol set screws in the raising disc (55) have pointed ends which fit into off-center holes in the pickup arm pivot (11). Loosen one screw and tighten the other until the needle rests above the lead-in groove of the record. Be sure both screws are tight when the adjustment is made.
6. Turn the record shelf (3) to the 12-inch position and check the needle drop on a 12-inch record. If any additional adjustment is necessary, it should be made by the eccentric screw mentioned in the first part of the "Set-Down Adjustment."

Automatic Trip Friction Clutch

The automatic trip friction clutch is produced by the clutch weight (45) resting on the automatic trip arm (46). This causes the automatic trip arm to follow the movement of the pickup arm, as the trip arm (46) gradually approaches the velocity trip lever (64), and carries it with it upon contact. However, the main cam actuating gear (60) has four equally spaced projections on its circumference which strike the velocity trip lever roller as the gear revolves. This forces the velocity trip (64) and automatic trip arm (46) back away from the tripping point; however, when the movement of the pickup arm toward the spindle is greater than ⅛" in ½ revolution of the turntable, the automatic trip arm (46) trips the velocity trip and roller assembly (64). This releases the actuating pawl on the main cam assembly (65), allowing it to engage the main cam

A PHOTOFACT "EXPLODED" VIEW

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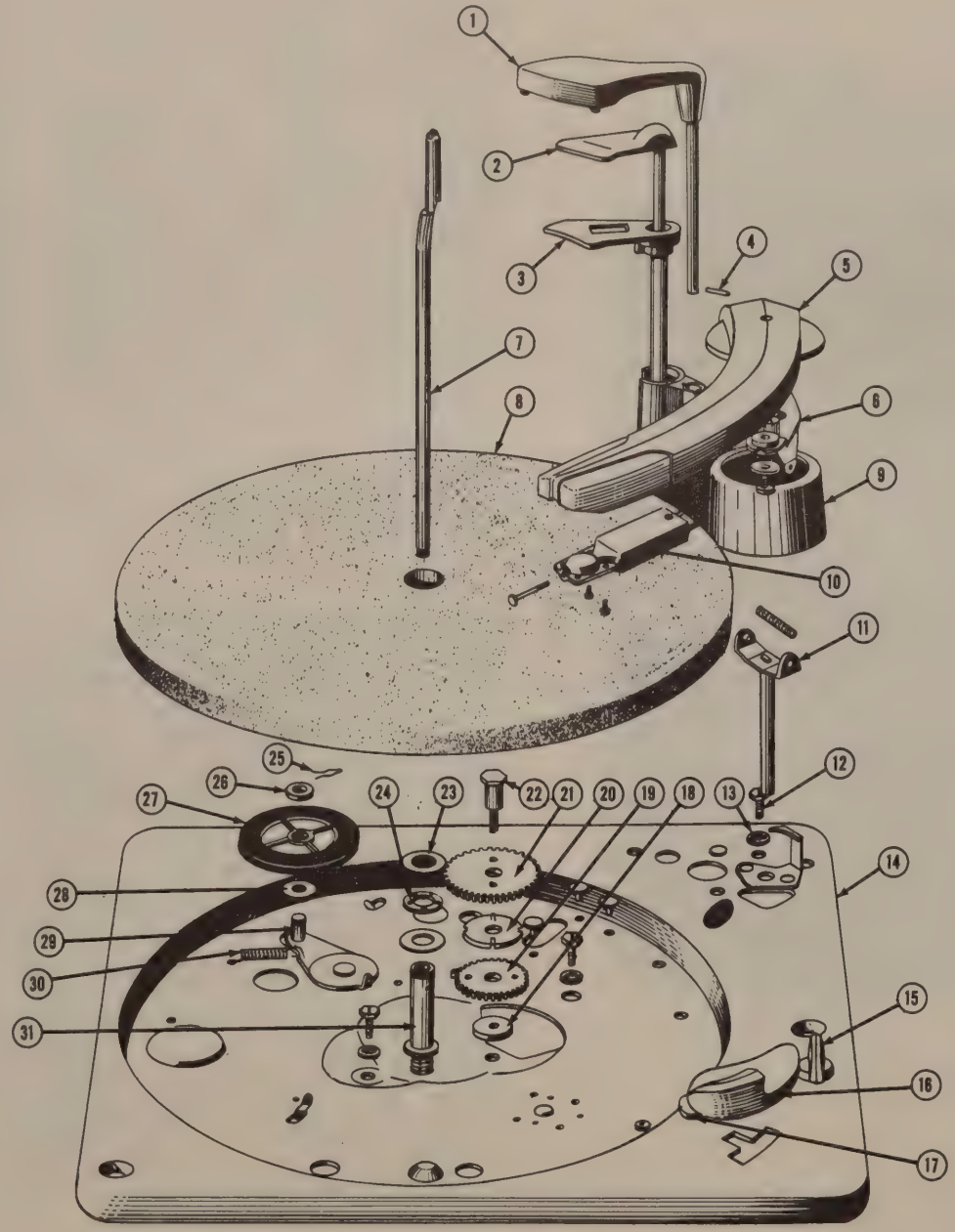

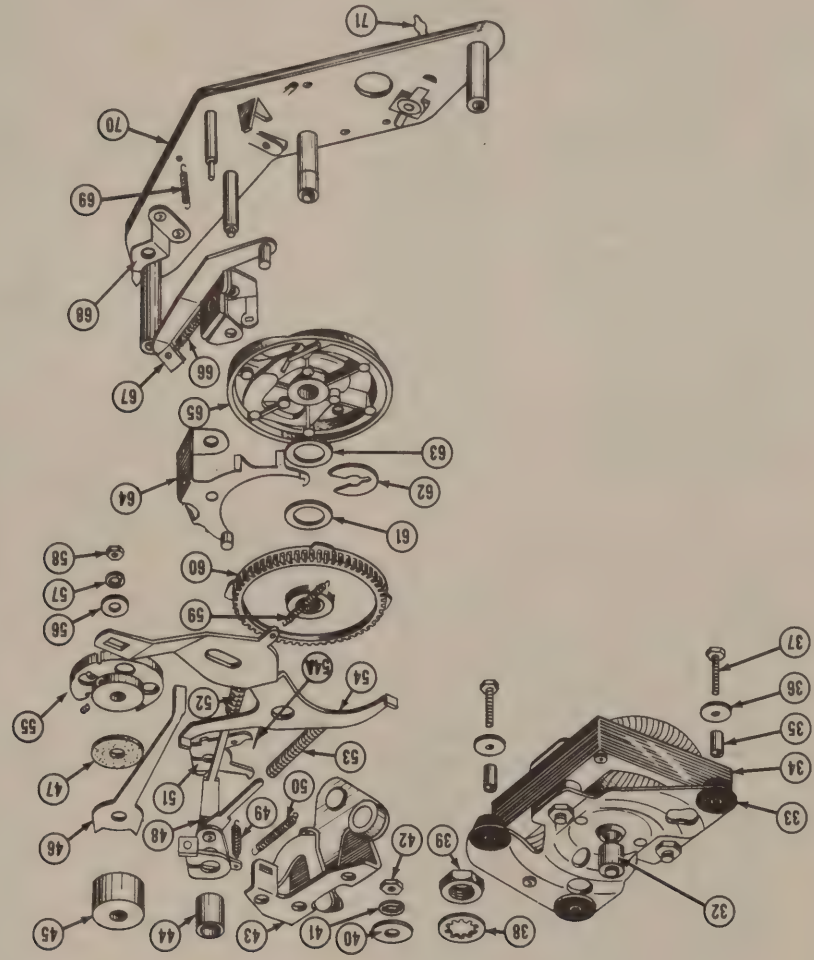
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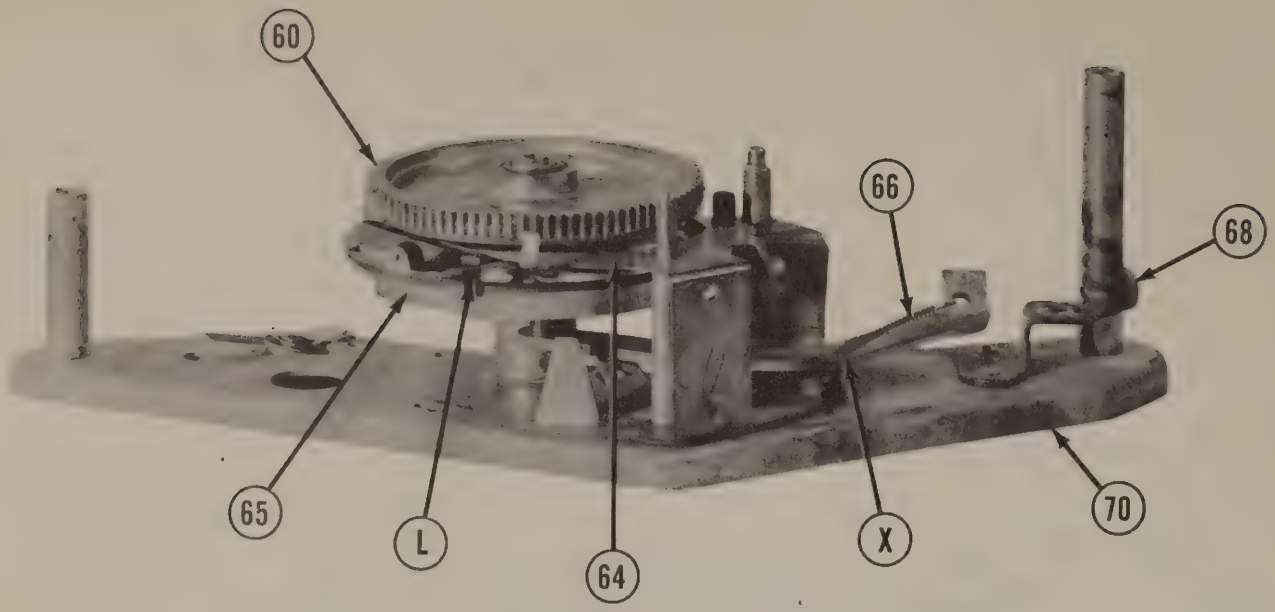


FIG. 4—RIGHT SIDE VIEW—SUB-ASSEMBLY

actuating gear (60), and driving it through the change cycle; however, if the clutch does not cause the automatic trip arm to trip the mechanism, clean the clutch parts with carbon tetrachloride. This clutch should operate the trip mechanism without placing undue drag on the movement of the pickup arm.

Velocity Trip and Roller Assembly

At the completion of the change cycle, the actuating pawl is disengaged from the main cam actuating gear by the hooked end of the velocity trip lever (64). If the clearance between the lip (L) on the velocity trip lever (64) and the edge of the main cam (65), Fig. (4), is too small, it will prevent the hooked end of the velocity trip lever from engaging the pawl. Adjust the clearance between the lip on the velocity trip lever (64) and the main cam (65) to be within 1/32 inch and 1/64 inch when the roller of the velocity trip lever is contacting the point of one of the reset points on the actuating gear (60).

Positioning of the Index Lever and Toggle Assembly

Improper positioning of the toggle assembly (48) may cause erratic indexing of the pickup arm (5). Indexing in either the 10" or the 12" position is controlled through the presence or absence of pressure from the compression spring (52) on the pickup arm raising lever bracket (67), forcing the stud to travel the inside edge or the outside edge of the groove in the bottom of the main cam (65).

When the record shelf is in the 12" position, the spring (52) should be just free of the raising lever bracket (67); while in the 10" position, the compression of the spring holds the stud of the pickup arm raising lever against the outside edge of the groove. If this is not true, the following adjustment is necessary:

1. Turn the record shelf (3) to the 12" position.
2. With the power plug out, trip the changer and rotate the turntable clockwise until the push-off blade (2) reaches its farthest forward position. At this point the cam follower (43) will be at the highest point on the main cam (65).
3. Loosen the lock bolt in the toggle assembly (48).
4. Be sure the record shelf (3) is held in the extreme 12" position while adjusting the lever and toggle assembly (48).
5. Push the push-off blade and record shelf assembly downward tight against the housing (9).
6. Position the index lever and toggle assembly (48) so that there is a space of approximately 1/64" between the rounded edge of the toggle (A) and the push-off blade finger (51) when viewed directly from the bottom of the record changer. Since these two parts lie on different planes, this adjustment must be made by observation only. Fig. 3 shows the relationship of these parts when the changer is out of cycle and in the 10" position.
7. While holding the push-off blade and record shelf assembly tight against the housing (9), push the index toggle assembly (48) up against the bushing (44), leaving a space of approximately 1/64" between the bushing and the baseplate, and tighten the lock bolt.

Push-Off Blade Adjustment

If the push-off blade (2) fails to extend beyond the edge of the record shelf (3) when at its greatest forward position, it should be adjusted as follows:

1. Turn the record shelf (3) to the 12" position.
2. With power plug removed, trip the mechanism and rotate the turntable clockwise until the push-off cam follower (43) reaches the highest point on the main cam (65).
3. Loosen the push-off blade finger (51) clamp bolt.
4. Push the push-off blade (2) forward, as far as possible, and hold the push-off blade and record shelf assembly downward, tight against the housing (9).
5. Tighten the push-off blade finger clamp bolt, leaving 1/64" vertical clearance between the shoulder of the record shelf shaft and the push-off blade finger (51).

TROUBLES

Failure to Trip

1. Grease or oil on the automatic trip friction clutch. Clean the clutch parts with carbon tetrachloride.
2. Velocity trip and roller assembly (64) binding.

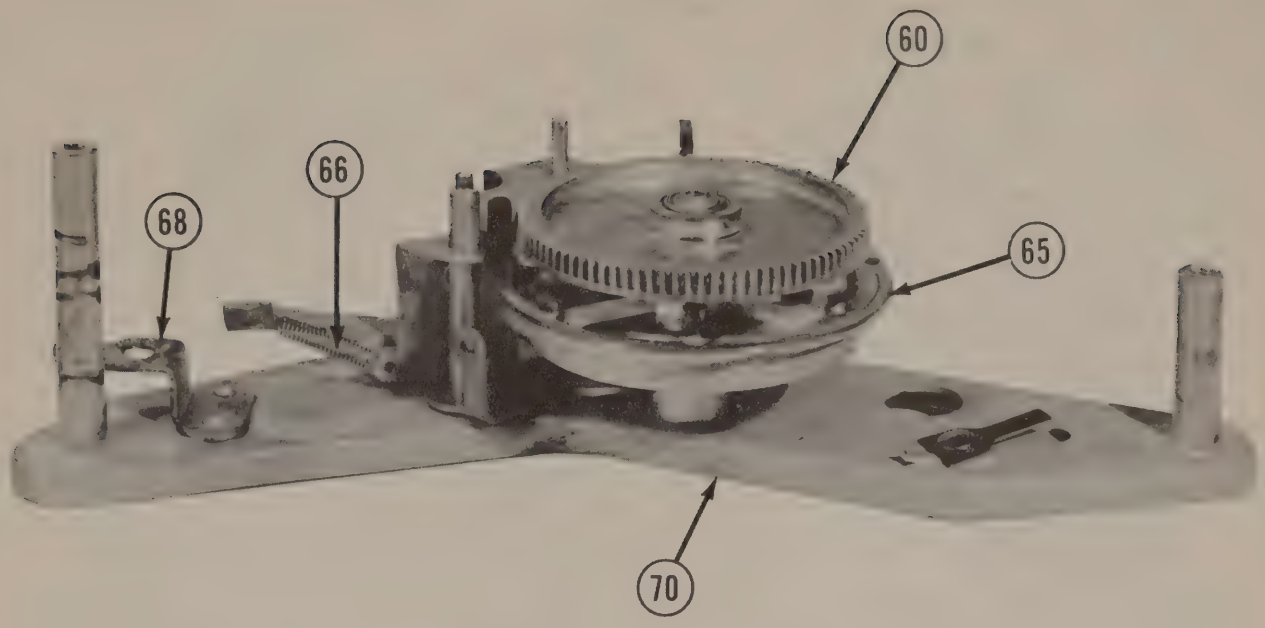


FIG. 5—LEFT SIDE VIEW—SUB-ASSEMBLY

3. Trip pawl on main cam (65) binding.

4. Velocity trip and roller assembly (64) rubbing on the underside of the main cam actuating gear (60).

5. Automatic trip arm (46) bent and not hitting the velocity trip and roller assembly (64).

Reject Trip Fails

1. Trip wire (54A) of trip lever (54) bent or broken.
2. Velocity trip and roller assembly (64) binding.
3. Trip pawl on main cam (65) binding.

Continuous Tripping

1. Roller on velocity trip assembly (64) missing.
2. Trip lever (54) binding.
3. Velocity trip (64) not engaging the trip pawl on the main cam (65). See adjustment on "Velocity Trip and Roller Assembly."

Records Fail to Drop

1. Push-off blade (2) out of adjustment. See adjustment on "Push-Off Blade."

2. Spring (49) loose, thereby allowing the push-off blade (2) to remain in a forward position at all times.

3. Push-off blade finger (51) bent, which results in its not being actuated by the cam lever assembly (43).

More Than One Record Drops at a Time

1. Spindle slide not fully down.
If the spindle slide is not all the way down, more than one record may drop at a time. Check the slide to see that it is free and does not bind at any point.

2. Exceptionally thin records.

Pickup Arm Drops Off Rest

When the pickup arm is in the rest position on the arm rest (15), the lip of the raising disc (55) rests in the space between the stud post and bracket. There should be 1/64" clearance between the tongue of the pickup arm and raising disc (55) and the bottom of the groove formed by the bracket (68) and the baseplate post. Bend the bracket end up or down to secure proper positioning of the disc tongue and the pivot bracket. Be careful to bend the end only or the bracket (68) will bind on the pickup arm pivot shaft (11). The bracket should not be too high or the disc tongue will rub on it when the needle approaches the edge of a 12" record, causing "glide in" on the first few grooves of the record.

LUBRICATION

Lubrication applied at the time of manufacture is usually sufficient for a long period of time; however, should it become necessary to lubricate, due to extreme conditions of dust, or heat, or excessive use, the mechanism should be lubricated as follows:

Use No. 10 Oil (apply with small oil can or medicine dropper).

1. Motor bearings. Saturate top and bottom felts.
2. Pickup arm shaft.
3. Ball-bearing assembly (24).
4. Idler wheel felt (26).

Use Lubriplate (apply with small brush).

1. Idler wheel link (29).
2. Turntable shaft stud (31).
3. Pickup arm hinge pins.
4. Knife edge of pickup arm raising lever (67).
5. Main cam bearing. (It is necessary to remove the sub-plate assembly to lubricate this bearing.)

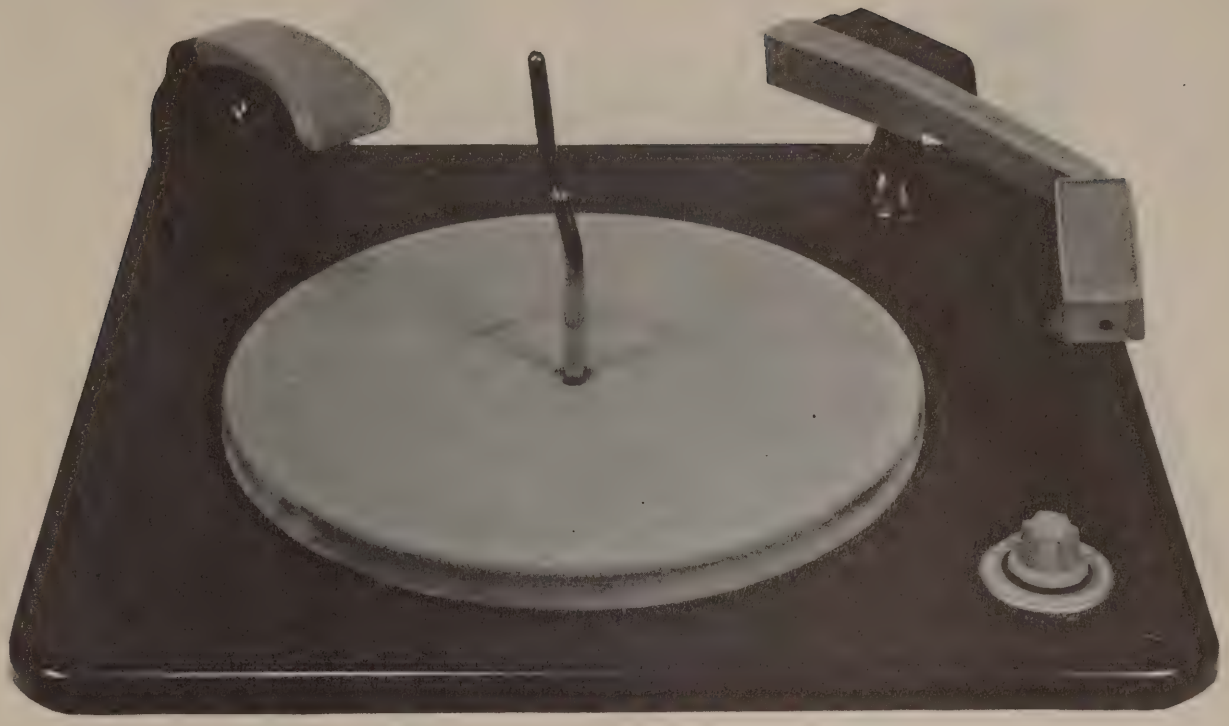
Use Sta-Put on the following (apply with small brush):

1. Teeth of the main cam actuating gear (60).
2. Track of main cam (65).
3. Teeth of idler gears (19) and (21).
4. Raising lever bracket (67) bearing surfaces.

CAUTION: Avoid excessive lubrication. Do not permit any oil or grease to get on the rubber idler drive wheel (27), or the motor sleeve (32) on turntable drive rim, or on the automatic trip arm clutch. Any oil or grease on these points should be removed, using carbon tetrachloride.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	11X288	Record weight assembly
	24P013	Record weight cushion—rubber
2	42X183	Push-off blade
3	42X184	Record shelf
4	27P157	Record weight groove pin
5	49X021	Pickup arm only
6	21X258	Pickup arm hinge assembly
7	11X283	Spindle assembly
8	11X138-C	Turntable
9	42P182	Housing
10		Pickup cartridge shure P93
11		Pickup arm pivot
12		No. 8-32 x ½ sub-plate mounting screw
13		Lock washer
14		Base plate
15	49P090	Pickup arm rest including speed nut
16	49X089	Control knob
17	24P004	Needle pad
18		Idler gear spacer washer
19	47P023	Small idler gear
20	45P342	Idler gear coupler
21	47P024	Large idler gear
22	41P333	Shoulder screw
23	25P269	Turntable bearing-washer
24	11X058	Turntable bearing
25	50P125	Idler retaining clip
26	25P030	Felt washer
27	11X003	Idler drive wheel
28	25P046	Idler fiber washer
29	11X068	Idler line assembly
30	46P112	Idler tension spring
31	41P414	Turntable stud
32	17X412-12	Sleeve—60 cycle
	17X412-11	Sleeve—50 cycle
33	25P363	Rubber shock mounts
34	15X090-1	Motor assembly—117 volts, 60 cycle
35	41P592	Motor mount sleeve
36	25P367	Motor mount spacer
37	26P312	Motor mount screw
38	25P333	Lock washers
39	26P687	Turntable speed nut
40		Flat washer
41		Internal tooth lock washer
42		Hex nut
43	11X284	Cam lever and bracket assembly
44		Toggle assembly bushing
45	41P576	Clutch weight
46	46P568	Automatic trip arm
47		Felt washer
48	11X287	Index compression lever and toggle assembly
49	46P044	Tension spring
50	46P158	Tension spring
51	11X312	Push-off blade finger
52	46P152	Compression spring
53	46P151	Compression spring
54	11X291	Trip lever and wire assembly
55	11X227	Pickup arm raising disc
56		Flat washer (for Item 54)
57		Lock nut (for Item 54)
58		Hex nut (for Item 54)
59	46P117	Tension spring
60	11X032	Main cam actuating gear
61		Cam spacer thrust washer
62		"C" clip
63		Cam spacer thrust washer
64	11X047	Velocity trip and roller assembly
65	11X033	Main cam
66	46P044	Raising lever tension spring
67	11X046	Pickup arm raising lever and bracket with springs
68		Pickup arm pivot bracket
69	46P139	Raising lever tension spring
70		Sub-plate
71	50P204	Spindle retaining clip



TOP VIEW

GENERAL INFORMATION

The Westinghouse V-4944 is a single-post changer designed to play automatically twelve 10-inch records or ten 12-inch records, not intermixed. This changer has a single knob control for "Off-Manual-Automatic and Reject." Any record may be rejected while playing by turning the control knob to "Reject" momentarily. The last record will be repeated until the changer is turned off. Power supply is 110 to 120 volts, 60 cycles, AC, unless otherwise specified.

WESTINGHOUSE ELECTRIC CORPORATION, HOME RADIO DIVISION, SUNBURY, PENNSYLVANIA

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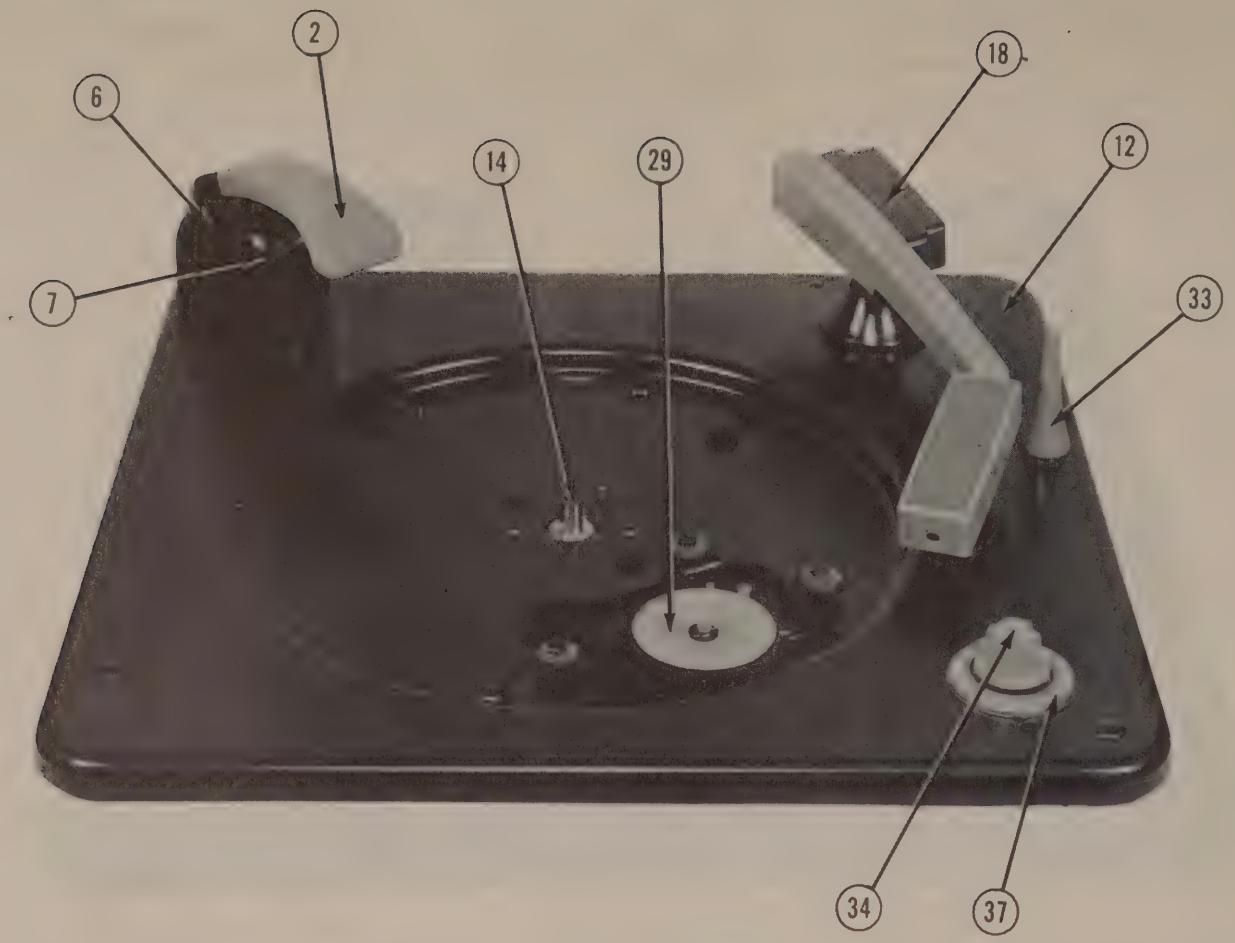


TOP VIEW—LESS TURNTABLE

MANUAL OPERATION

To play single records or home recordings, lift the plastic hold-down to an upright position and set the ejector slide to the 12-inch position. Carefully work the record past the off-set shoulder of the spindle to the turntable. Turn the control knob to "Man.," and place needle in playing position on record. The changer can be stopped in the normal position.

CHANGE CYCLE

The change cycle may be started by one of two actions:

1. Turning the control knob to reject causes the control cam (52) to actuate the control link (59) allowing the trip link (69) to be pulled away from the follower (72). The follower then tilts and engages the worm (76).

2. As the pickup arm moves into the eccentric groove of the record, the movement of the pickup (18) causes the pickup crank (41) to pivot the trip crank (53). The adjusting screw (55) of the trip crank will then push against the trip plate (56) allowing the trip link to release the follower. The follower (72), which transmits power for the change cycle, then engages the worm (76) and moves downward. The trip crank and lift rod assembly (53) is now pushed upward through the action of the follower arm (62). The long arm of the trip crank rides up the inclined portion of the index (47) raising the pickup and swinging it out clear of the records. As the follower (72) continues to move downward, the follower arm (62) is pivoted against the adjusting screw of the ejector arm (73), actuating the trigger assembly (11), which, in turn, moves the ejector slide (7) dropping a record to the turntable.

At this point the follower (72), guided by the follower guide (75), moves up the worm. As the follower arm (62) moves away from the adjusting screw of the ejector arm (73), the ejector slide (7) returns to its rest position. Also, through the action of the follower arm (62), the trip crank and lift rod assembly (53) rides off the inclined portion and down the face of the index (47), positioning the pickup and lowering it to the record. The follower now moves off the worm and is latched by the trip link (69).

ADJUSTMENTS

Set-Down Point

To adjust the set-down point, cycle the changer and stop the turntable just before the needle comes down on the record. Loosen the lock nut (46) and adjust the index screw (45). Turning the screw clockwise will move the pickup toward the center; counterclockwise the pickup will move away from the record. Adjust so the needle rests ⅛" in from the edge of the record.

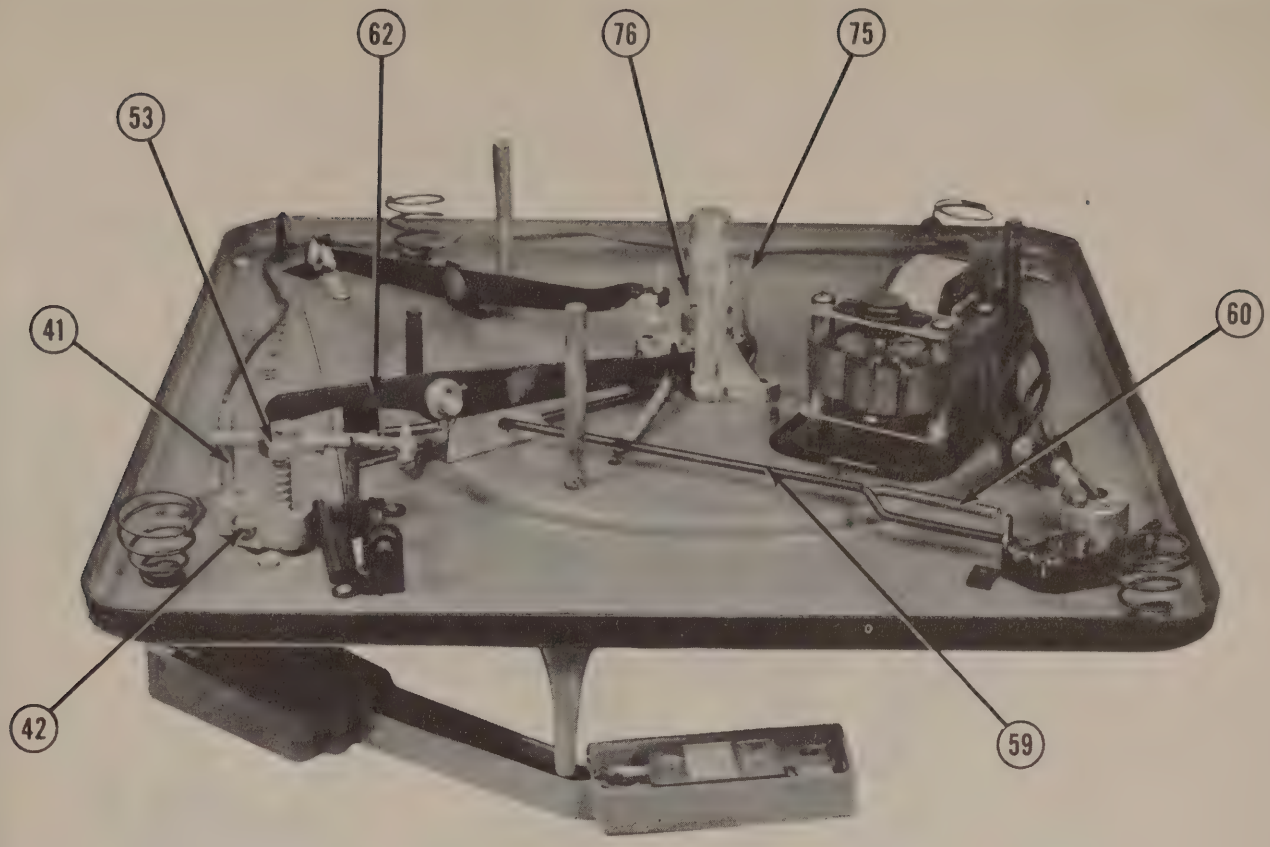
The set-down adjustment may be made with either 10-inch or 12-inch records and should be correct for both. If the set-down has been disturbed by holding the pickup arm during cycle, or if the pickup crank is loose, the following approximate adjustment should be made before adjusting the index screw. Loosen the set screw in the pickup crank and turn the crank until it is stopped by the screw in the base plate. With the crank in this position, move the pickup arm to about ¼" from the spindle and tighten the set screw.

Positive Trip

The positive trip screw (55) should be adjusted to trip the changer when the needle reaches a point 1⅞" from the center of the record. Loosen the lock nut (58) so as to have free action of the screw. By turning the screw clockwise, the trip point will be moved away from the center; counterclockwise, the trip point will move in toward the center. After adjusting the screw, the lock nut should be tightened to maintain the adjustment.

Pickup Arm Height

The pickup arm height adjustment is made by turning the screw (24) in the lift rod assembly (53). To get to this adjustment, raise the pickup to a vertical position. Adjust so the pickup arm clears the unplayed stack by about ⅛" at its highest point during the change cycle.



BOTTOM—SIDE VIEW

Timing of Record Drop

The timing of the record drop is adjusted by the screw (64) on the end of the ejector arm (73). The adjustment should be such as to just release the bottom record of a stack of ten 12-inch records in cycle.

Ejector Slide Adjustment

The ejector slide is adjusted by the screw (80). The adjustment should be such that the tabs are normally about 1/32" from the edge of a record.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use or high operating temperature, the changer should be lubricated as follows:

Apply Lubriplate to

1. Worm threads (76).
2. Lift shaft (53).
3. Contact point between pickup crank (41) and trip crank (53).
4. Follower arm (72):
   (a) At pivot of fulcrum (67).
   (b) At contact point of trip crank (53).
   (c) At contact point of sub-frame (77).
5. Ejector Arm (73):
   (a) At contact point with trigger (11).
   (b) At contact point of follower arm (62) and screw head (64).
6. Index (47) on surfaces of slide for trip crank arm (53).
7. Follower guide (75) where follower (72) bears.

Apply a Small Quantity of Light Oil to

1. Between turntable shaft (14) and storage shaft (1).
2. Follower (72) at pivot with follower arm (62).
3. Ejector arm (73) at pivot with ejector fulcrum.
4. Index (47) at bearing with slide bracket (43).
5. Trip link (69):
   (a) At bearing in fulcrum (67).
   (b) At bearing in trip bracket (70).
6. Trip plate (56) at bearing in fulcrum (67).

SERVICE INFORMATION

Turntable Does Not Revolve When Control Knob Is Turned to "On" Position

1. Machine stalled in cycle:
   Turn the turntable carefully by hand until it starts rotating under its own power.
2. No current at motor.
3. Motor defective:
   Remove the turntable to allow the motor to operate without load. If current is reaching the motor and the pulley does not rotate, the motor is defective.
4. Motor idler wheel not engaging turntable rim:
   (a) Check the motor idler assembly to see that it slides freely.
   (b) Wipe off the inside rim of the turntable to remove flock, or, if oily, clean the turntable rim and the rubber tire of the idler wheel with carbon tetrachloride.
5. Turntable bearing tight:
   Hold idler wheel away from turntable or remove idler wheel and rotate turntable by hand to see that it is free. If binding occurs, remove the turntable and lubricate the oilite turntable shaft bearing with light oil.

Changer Does Not Cycle When Control Knob Is Turned to "Rej." Position

1. Changer stalled or motor not driving turntable.
2. Manual reject not actuating trip:
   Turn the control knob to "Rej." position; hold and see if the hook on the end of the trip link (69) is pulled back sufficiently to allow the worm follower (72) to drop and engage in the worm threads (76):
   (a) If the trip link does not release the follower, check the control link rod (59). If the rod is bent, carefully

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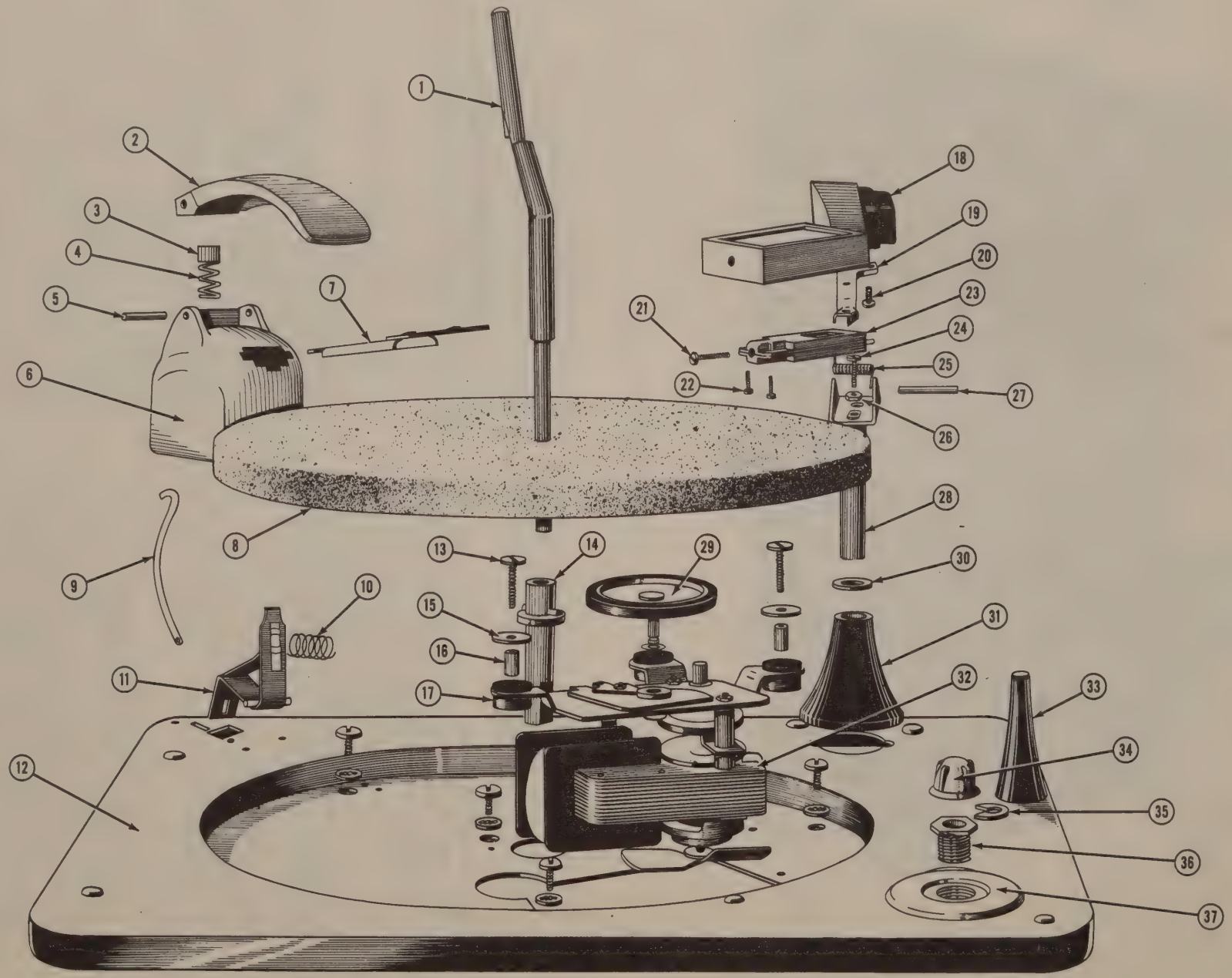

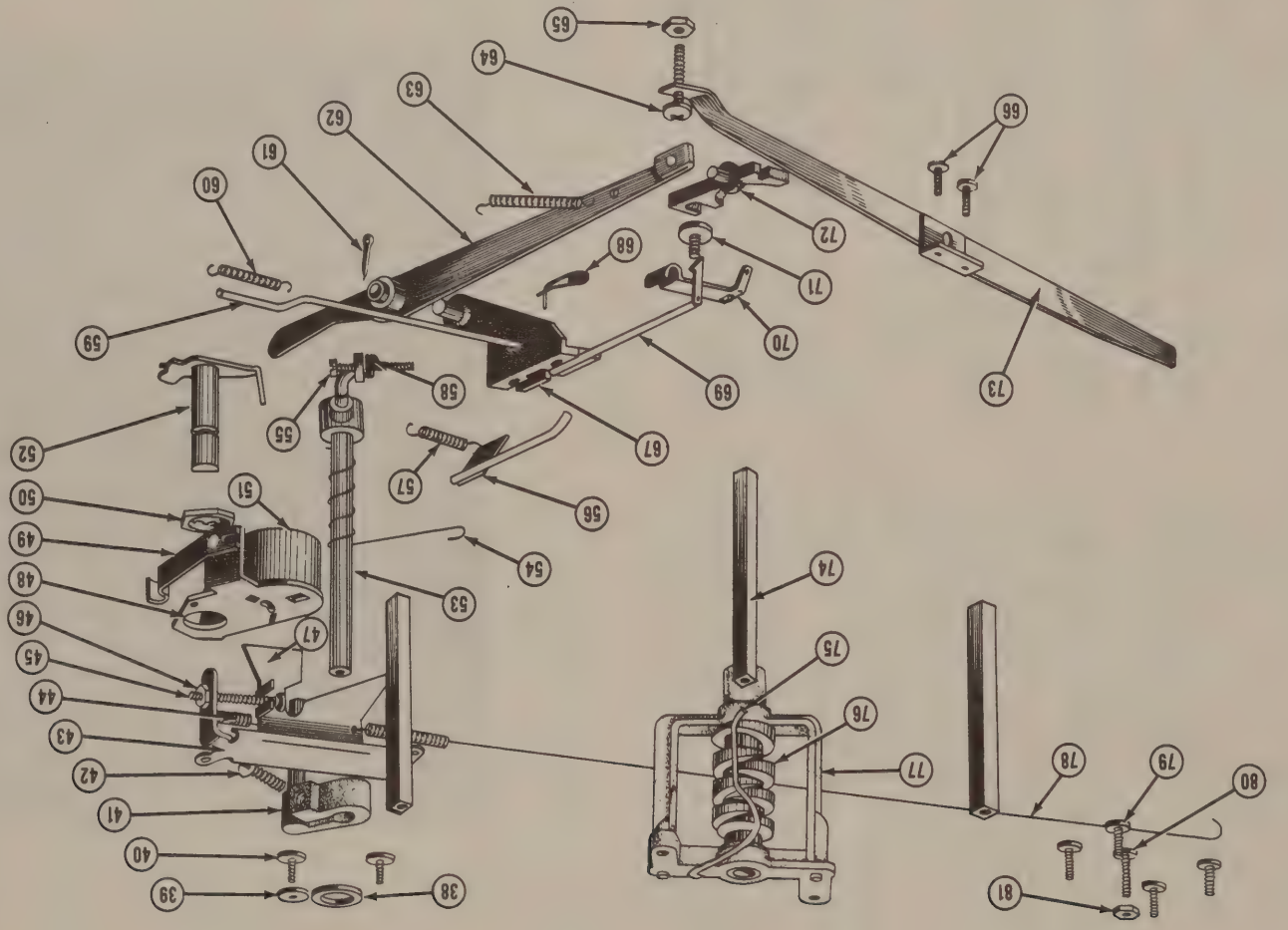
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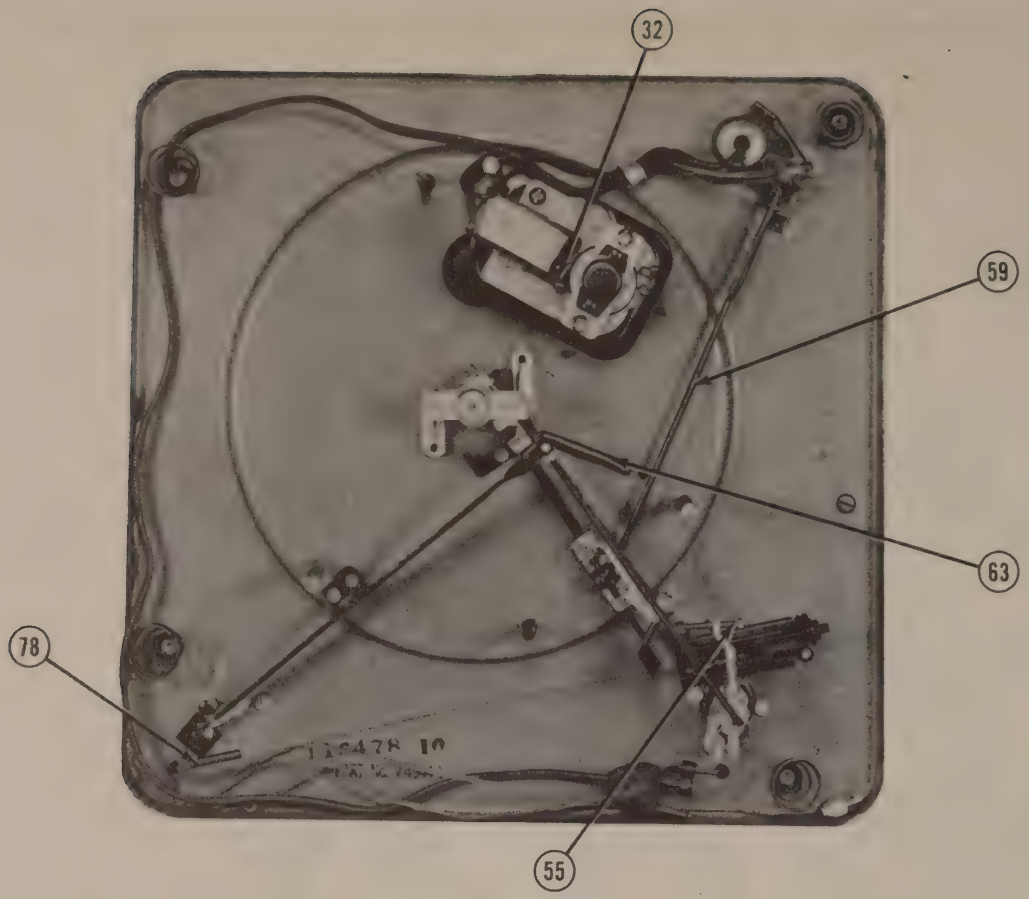


BOTTOM VIEW

straighten it and check for trip again.

(b) If the trip link is not restricting the follower, but the follower still does not engage in the worm, the follower must be removed from the follower arm (62) and dirt or other foreign matter cleaned from the pivot point and from between the two parts. Excessive grease may cause this binding.

To remove the follower:

1. Be sure the changer is not in cycle.
2. Remove the turntable.
3. Remove the two screws from base plate and sub-frame (77).
4. Carefully work the sub-frame assembly out of the base plate and revolve the assembly counterclockwise to work off of the follower and follower arm.
5. Remove the follower.

(c) If the follower drops but does not engage in the worm:

1. Check for excessive wear in the pivot of the follower and follower arm.
2. Check to see if the spring (63) has become unhooked.
3. Check for dirt in the follower-follower arm pivot.

3. Turntable not engaging turntable lock.
4. Turntable lock loose on turntable shaft.

Record Does Not Drop When Changer Cycles

1. Check for bent spindle (1).
2. Check for under or over-size record or enlarged center hole.
3. Check position of ejector slide (7) as given under "Adjustments."
4. Check the screw in the ejector arm (73) to see if it hits follower arm (62) when the follower is at the bottom of the worm. If the lock nut on this screw has worked loose, reset the screw as given under "Adjustments."
5. Check to see if the ejector slide (7) is properly seated with its pushing mechanism on the trigger (11).
6. Check for a defective trigger by slowly pulling the ejector arm (73) down by hand. If a record does not drop, the trigger (11) must be repaired or replaced.

To remove the trigger:

(a) Unhook the index spring (78) from the ejector link (9).

(b) Remove the four screws from the base plate and the housing assembly.

(c) Lift the trigger from the housing and check for broken weld on strengthening brace.

Two Records Drop at Once

1. Hole in record too large or records too thin.
2. Slide in spindle not fully down.

(a) Check slide to be sure it is free and does not bind at any point. Clean out foreign matter or straighten if necessary. Do not oil.

(b) When records are placed on the spindle, be sure the slide is all the way down.

3. Check for position of ejector slide (7).

Record Hits Pickup Arm

1. Check timing of changer cycle as given under "Adjustments."
2. Check for a creeping index (47). Index "creeps" if it moves when the changer goes through cycle. To correct this condition:

(a) Be sure that the pickup (18) and pickup crank (53) are aligned as given under "Adjustments."

(b) Place the ejector slide (7) in 12" position; cycle the changer until the follower is at the bottom of the worm. The index spring (78) should be just barely slack. The ejector link (9) may be bent forward or back to give the index spring this required slack.

3. Check for too much gap between the follower arm (62) and the trip crank. This gap should be about the thickness of a sheet of paper (.005" to .016"). To reduce the gap, do one of the following:

(a) Bend the follower arm up.
(b) Replace the follower arm.

Needle Does Not Set on Both 10" and 12" Records

1. Check the needle set down for 10" position by holding the index (47) in with the fingers as far as it will go and cycling the changer.

2. Check the needle set down for 12" position by holding the index out with the fingers as far as it will go and cycling the changer.

3. If these positions are correct when the index is held in either position, check for "creeping index."

4. Check for bind between guide tabs on the index and the index screw (45).

5. Check for bind between the index and the index slide bracket (43).

Needle Does Not Track Across Record Properly

1. Check for gap between follower arm and trip crank. This gap should be about the thickness of a sheet of paper (.005" to .016"). To increase the gap, do one of the following:

(a) Bend the follower arm down.

(b) Place an appropriate thickness washer over the lift shaft (53) and under the lift nut (26).

2. Check for lack of vertical play of the pickup shaft in the pickup post (31). There should be .003" to .010" play here. To correct, loosen the screw in the pickup crank (41), place a shim between the pickup hinge washer and the pickup post and reset the pickup and pickup crank.

3. Check for lack of lubrication between the pickup shaft and the pickup post.

Center Trip Defective

1. Check to be sure the control knob is in "AUT" position.

2. If changer trips too soon or too late, readjust screw (55) as given under "Adjustments."

3. If the changer does not trip, push the trip plate (56) back by hand and see if the hook on the trip link (69) is pulled back sufficiently to release the worm follower. If the trip link hook does not release the follower, check for the following:

(a) Weak or damaged spring (68).

(b) Bind between trip bracket (70) and trip link.

(c) Binding due to burrs between the fulcrum (67) and the trip link.

(d) If none of the above show trouble, bend the tail of the trip link (69) in toward the side of the fulcrum. This will allow the hook on the other end of the trip link to pull back farther.

4. If the changer continues to trip, check for the following:

(a) Spring (57) weak or unhooked.

(b) Binding between the trip plate rod and the fulcrum.

(c) Too much clearance between the hook on the trip link, and the follower. Correct by bending the tail on the trip link away from the side of the fulcrum. This will cause the hook end of the trip link to engage the follower more closely.

5. If the needle jumps out of the eccentric groove on record:

(a) Check trip pressure. This should not exceed 12 grams. If trip pressure is too high, check:

1. For binding.

2. Spring (57) too strong. May be weakened by carefully stretching one of the center loops.

(b) Record may be defective. The trip grooves are often too shallow. Check with a record known to be good.

(c) Needle point may be worn.

Turntable Speed Too Slow

1. Binding in turntable bearing.

2. Motor driveshaft too small in diameter. Replace with motor driveshaft of correct diameter.

3. Line voltage too low. A 115-volt changer should not be operated at less than 100 volts.

4. Operating temperature too low. Surrounding temperature should be not less than 60°F.

Turntable Speed Too Fast

Motor driveshaft too large in diameter. Replace with motor driveshaft of correct diameter.

Turntable Stalls in Cycle

1. Motor idler not engaging turntable with sufficient tension.

2. Turntable bearing tight.

3. Operating temperature too low.

4. Line voltage too low.

5. Binding between follower and worm:

(a) Check lubrication of follower arm at point of bearing with sub-frame.

(b) Check lubrication of worm threads.

(c) File some metal from the follower arm at the point of bearing with the sub-frame to allow more clearance between the worm and the follower.

1. Remove follower as described in second paragraph.

2. Remove spring (63).

3. Remove cotter pin (61).

4. Remove follower arm.

6. Trip crank (53) jams on index (47):

(a) Check for lubrication on index at point of bearing with trip crank.

(b) Check for burrs on the inclined surface of the index. Surface must be very smooth. Polish with crocus cloth.

(c) Check for grooves worn into trip crank arm at contact point with index. File smooth with fine file, if necessary.

Noise During Playing of Record

1. Rumble:

(a) From Motor: If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check the motor grommets to be sure the motor is freely suspended on them. The motor lead wires should have slack to allow the motor to float. Motor rumble may also come from an out-of-balance motor rotor. In this case, the motor should be replaced.

(b) From Bearings: Defective turntable shaft bearings can cause rumble. Check for foreign matter. Lubricate with lubriplate or light oil.

2. Defective Motor Idler Wheel:

A rapid thumping sound while the motor is running may indicate a flat spot on the motor idler wheel. Remove the turntable and check the rubber tire on the idler. If the surface of the rubber tire is not smooth and even, replace the idler.

3. Defective Needle:

A bad needle will cause loud needle scratch or hiss through both the speaker and the air directly from the needle.

4. Turntable Scrapes:

If a scraping sound occurs as the turntable revolves, check:

(a) Turntable warped, causing outer rim to rise and fall.

(b) Motor idler bent.

5. Squeaks:

Squeaking sound as changer operates indicates lack of lubricant. Lubricate points indicated under "Lubrication."

Noise During Cycling

1. There is normally an audible snap when the follower engages with the hook end of the trip link at the end of the cycle.

2. Squeaks: See "Lubrication."

3. Grinding sound indicates lack of lubrication or worn parts.

Excessive Record Wear

1. Binding in pickup arm.

2. Defective needle.

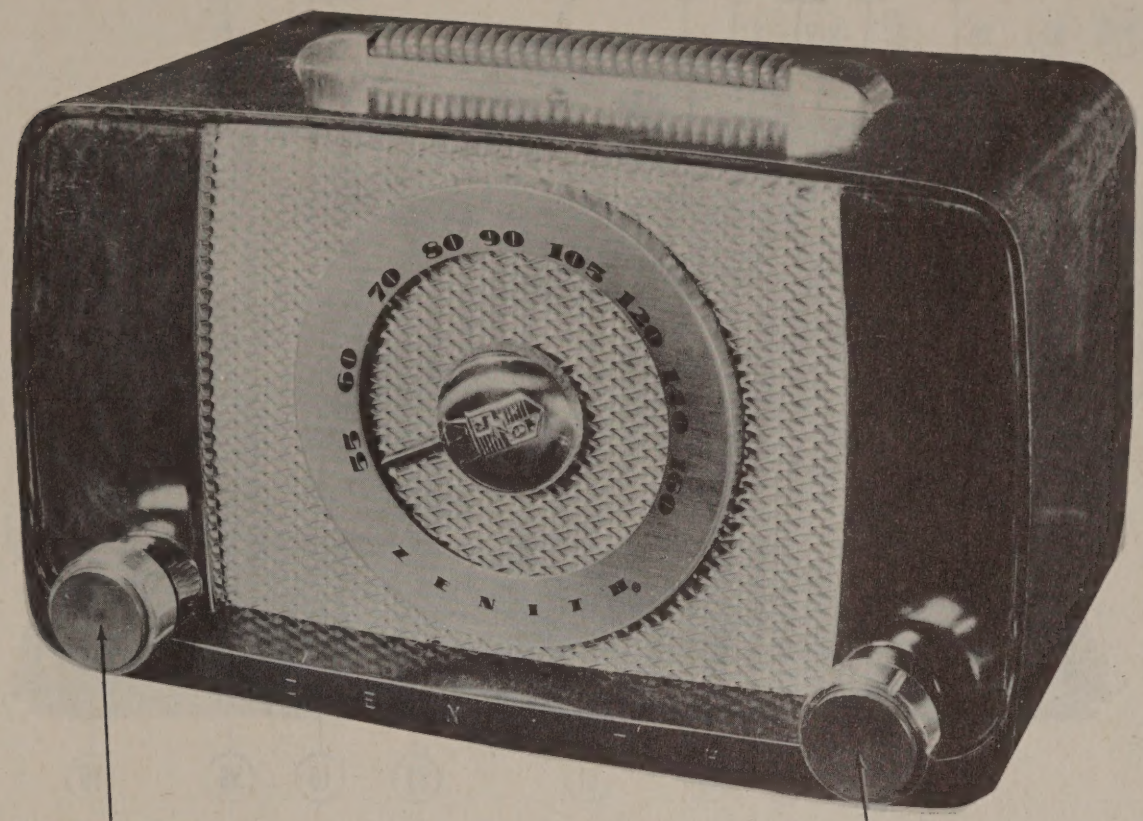
3. Excessive needle pressure:

The pickup arm is designed to give the proper needle pressure when an aluminum cased cartridge is used. If a cartridge with a die-cast housing is used, a compensating spring must be used to bring the needle pressure down to the usual standard of 1-1½ oz. If the needle pressure is too great on a pickup arm using a compensating spring, bend the long end of the spring.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	V-7238	Spindle assembly
2	V-7241	Record hold down
3	V-7306	Hold-down cup
4	V-7305	Record hold-down spring
5	V-7070	Hinge pin
6	V-7243	Record support housing
7	V-7242	Ejector slide
8	V-7237	Turntable
9	V-7286	Ejector link
10	V-7307	Trigger spring
11	V-7308	Trigger assembly
12	V-7233	Base plate
13	V-7131	Motor mounting screw No. 6 x ⅝ type "Z"
14	V-7311	Turntable shaft
	V-7312	Turntable shaft assembly
15	V-7255	Motor mounting washer
16	V-7253	Motor spacer
17	V-7254	Motor mounting grommet
18	V-5300	Pickup arm
19	V-7094	Pickup arm strengthener
20		Screws for strengthener
21	V-7038	Needle mounting screw
22	V-3952	Cartridge mounting screw
23	V-3777	Cartridge
24	V-7301	Pickup arm height adjustment screw No. 5-40 x ½
25	V-7188	Counterbalance spring
26	V-7302	Pickup arm height adjustment nut
27	V-7070	Pickup hinge pin
28	V-7303	Hinge assembly
29	V-7252	Idler wheel
30	V-7300	Fiber washer
31	V-7231	Pickup post
32	V-7251	Motor 110 V., 60 cycle
33	V-7249	Pickup arm rest
34	V-7084	Control knob
35	V-7083	"C" washer
36	V-7250	Control shaft bearing
37	V-5018	Escutcheon
38		Flat washer
39	V-7236	Washer
40		Pickup post mounting screw No. 6 x 5/16
41	V-7273	Pickup crank
42	V-7272	Pickup crank screw No. 10-32 x ⅜ B.H.
43	V-7275	Slide bracket
44	V-7269	Slide return spring
45	V-7267	Slide index screw
46	V-7268	Index lock nut No. 10-32
47	V-7270	Index slide
48	V-7297	Switch bracket
49	V-7256	Switch cam spring
50	V-7257	Control bearing nut
51	V-7295	Switch
	V-7296	Switch assembly (including items 48 and 49)
52	V-7258	Control assembly
53	V-7271	Trip crank shaft
54	V-7274	Pickup crank spring
55	V-7266	Adjusting screw No. 6-32 x 1"
56	V-7277	Trip plate assembly
57	V-7264	Trip plate spring
58	V-7265	Lock adjustment spring
59	V-7260	Control link
60	V-7259	Control rod spring
61		Cotter pin
62	V-7262	Follower arm assembly
63	V-7261	Follower arm spring
64	V-7281	Ejector adjustment screw No. 6-32 x ⅝
65	V-7280	Nut
66		Fulcrum mounting screws
67	V-7278	Fulcrum
68	V-7289	Trip link spring
69	V-7279	Trip link
70	V-7288	Trip bracket
71		Trip bracket mounting screw
72	V-7292	Follower
73	V-7283	Ejector arm
74	V-7294	Leg
75	V-7293	Follower guide
76	V-7315	Worm gear
77	V-7291	Sub-frame
	V-7317	Sub-frame assembly (including 75, 76 and others)
78	V-7276	Index spring
79		Support housing mounting screw
80	V-7287	Ejector adjustment screw No. 6-32 x ½
81	V-7280	Hex nut No. 6-32

ZENITH MODELS G615, G615W, G615Y (Ch. 6G05)



ZENITH MODELS G615, G615W, G615Y (Ch. 6G05)

ZENITH MODEL G615

TRADE NAME	Zenith Models G615, G615W, G615Y (Ch. 6G05)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types 12BA6 RF Amp., 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 35L6GT Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC or DC — RATING .26 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on center section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune for max. output	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	DET.-AVC-AF	12AT6	12AT6	7BT	
V5	Power Output	35L6GT	35L6GT	7AC	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	150	22-1808	AF888D †	UP8415		EL-340 †	■ Filter
B	40	150						▲ Filter
C2	.05	200	22-829	P288-05	PTE4S5		TM-15	AVC Filter
C3	.05	200	22-829	P288-05	PTE4S5		72P51	Line Isolation
C4	.05	200	22-178	P288-05	PTE4S5		TM-15	Tone Compensation
C5	.01	600		P688-01	PTE6S1	821-01	TM-11	Audio Coupling *
C6	.0005	600		1468-0005	5W5T5	GP2K-500	TC-35	AF Amp. Plate Bypass *
C7	.004	600		P688-004	PTE6D4	811-005	TM-24	Audio Coupling *
C8	.01	400	22-1182	P488-01	PTE4S1	821-01	TM-11	Output Plate Bypass
C9	.05	400	22-1017	P488-05	PTE4S5		TM-15	Line Filter

* Items C5, C6 and C7 may be combined into one unit obtainable under MFGR'S Part No. 105-14.
† Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	1 Meg.	½	63-1664	Q13-137	AM-63-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

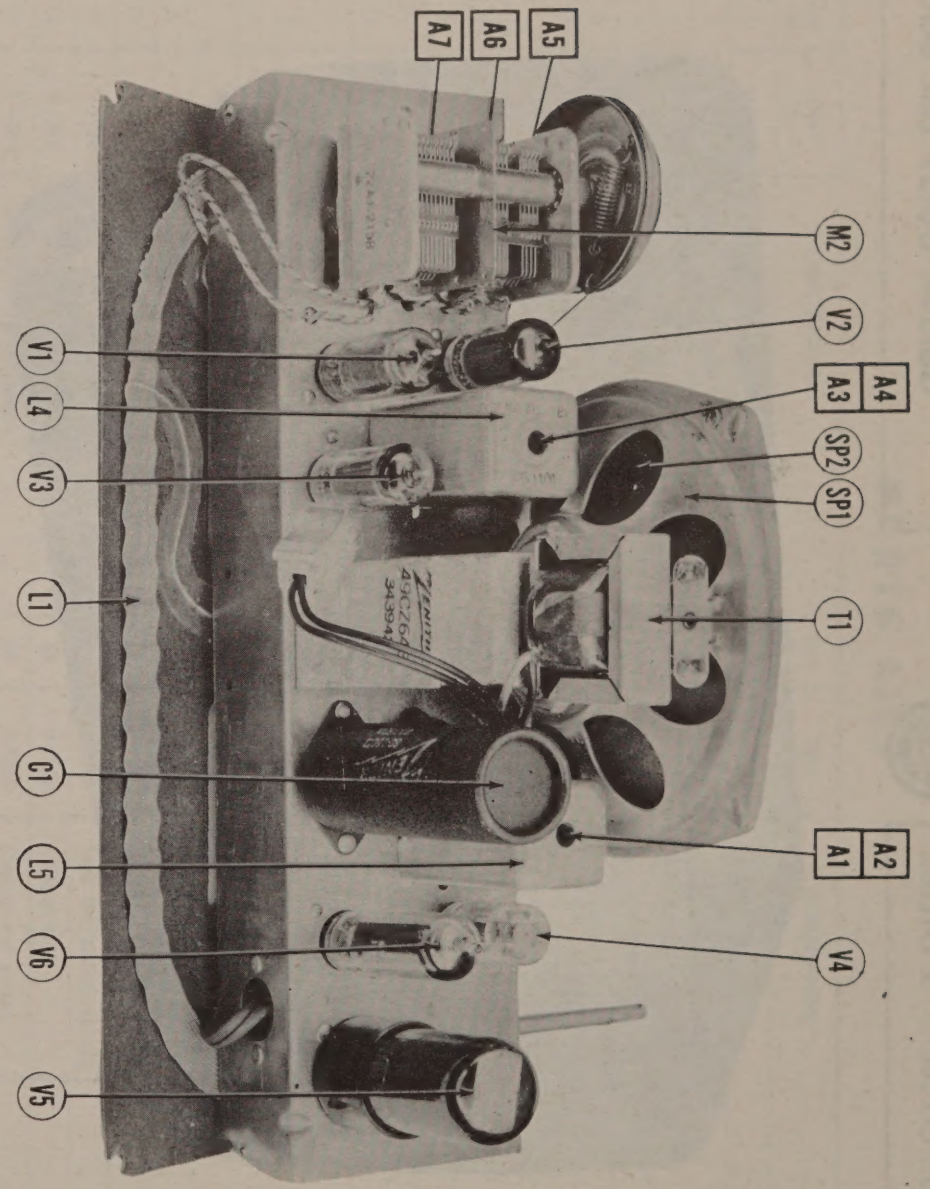
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	
R2	330Ω	½	63-1765	BW-½-330	RF Cathode
R3	10KΩ	½	63-1828	BTS-10K	RF Plate
R4	1000Ω	½	63-1786		Parasitic Supp.
R5	22KΩ	½	63-1842	BTS-22K	Osc. Grid
R6	100Ω	½	63-1744	BW-½-100	IF Cathode
R7	1 Meg.	½	63-1912	BTS-1 Meg.	Diode Load
R8	2.2 Meg.	½	63-1926	BTS-2.2 Meg.	AVC Network
R9	4700Ω	½	63-1814	BTS-4700	Tone Compensation
R10	2200Ω	½	63-1800	BTS-2200	Tone Compensation
R11	4.7 Meg.	½	63-1940	BTS-4.7 Meg.	AF Grid
R12	470KΩ	½	63-1898	BTS-470K	AF Plate
R13	470KΩ	½	63-1898	BTS-470K	Output Grid
R14	150Ω	1	63-1977	BW-1-150	Output Cathode
R15	1000Ω	1	63-1574	BW-1-1000	Filter
R16	22Ω	½	63-1219		Surge Limiter- Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.8KΩ	3.4Ω	265Ω	.5Ω	206-643	A-3876 §	A-2928 §	RO-2 §	§ Bend mounting tabs and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ZENITH PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-103 #		# Fabricate new mounting bracket.
SP1	PM	3.4Ω	49-643	MOD. P6-X	52A1 ‡	‡ Use mounting bracket provided.
	CONE DIA.	V. C. DIA.				
SP2	5"	9/16"				

R F COILS

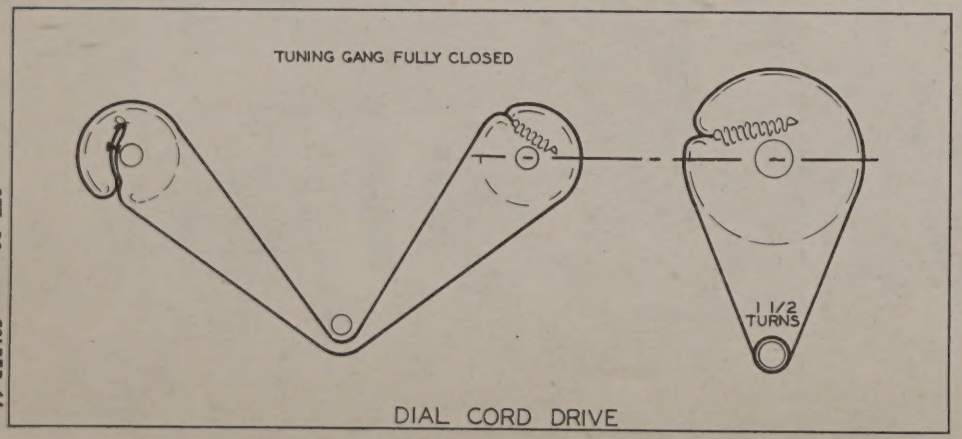
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA MEISSNER PART No.
L1	Loop Ant.	3Ω		S-14888	
L2	RF Coil	2.5Ω	9.7Ω	S-14832	
L3	Osc. Coil	.4Ω	8Ω	S-14833	14-1073
L4	Input IF	20Ω	20Ω	94-1101	16-6666
L5	Output IF	20.5Ω	20.5Ω	95-1102	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ZENITH PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	100-67		Type #47

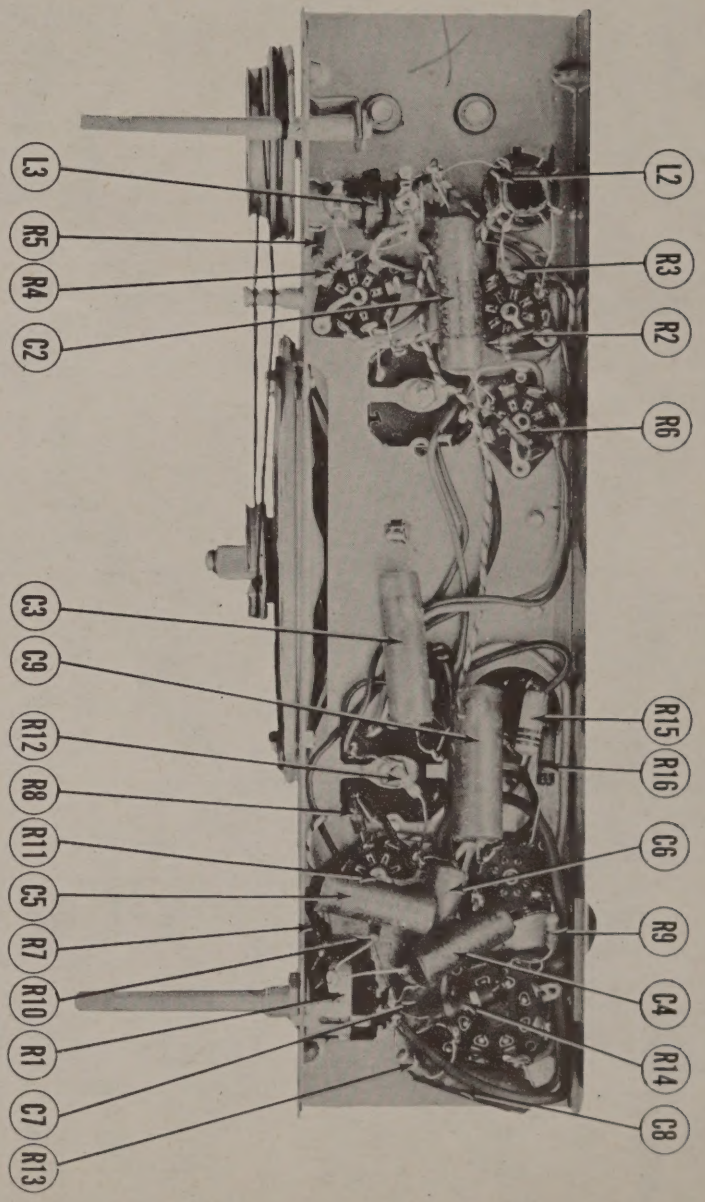
MISCELLANEOUS

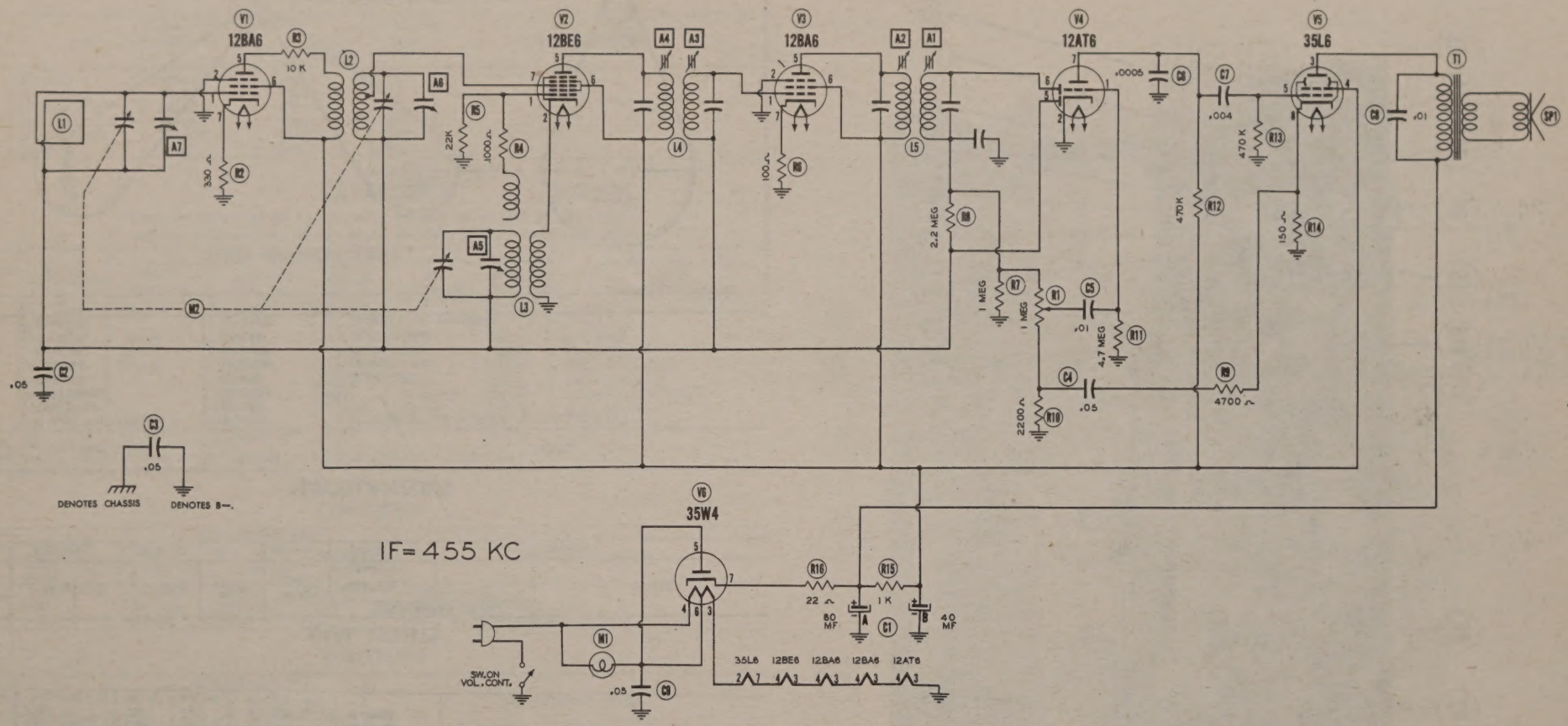
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	3 Gang Var. Cap.	22-1605	(17-352MMF, 15-222MMF, 14-84MMF) W/T
	Dial Sclae	26-434	
	Dial Pointer	59-238	
	Cabinet	14-1015	Model G615
	Cabinet	14-1015W	Model G615W
	Cabinet	14-1015Y	Model G615Y
	Knob	46-744	Model G615W
	Knob	46-744Y	Models G615 and G615Y



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BA6	-1.2VDC	0V.	27VAC	40VAC	55VDC	90VDC	1VDC	
V 2	12BE6	8-5.8VDC	oV.	40VAC	52VAC	90VDC	90VDC	-.5VDC	
V 3	12BA6	-1.2VDC	0V.	12VAC	27VAC	90VDC	90VDC	.9VDC	
V 4	12AT6	-.6VDC	0V.	0V.	12VAC	-1.1VDC	-.6VDC	35VDC	
V 5	35L6GT	0V.	87VAC	110VDC	90VDC	0V.	117VDC	52VAC	5.6VDC
V 6	35W4	5.4VDC	0V.	87VAC	117VAC	111VAC	111VAC	120VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BA6	3 Meg.	0Ω	25Ω	36Ω	†11KΩ	†1000Ω	330Ω	
V 2	12BE6	22KΩ	.5Ω	38Ω	48Ω	†1000Ω	†1000Ω	3 Meg.	
V 3	12BA6	3 Meg.	0Ω	12Ω	25Ω	†1000Ω	†1000Ω	100Ω	
V 4	12AT6	4.7 Meg.	0Ω	0Ω	12Ω	3 Meg.	500KΩ	†470KΩ	
V 5	35L6GT	Inf.	83Ω	†260Ω	†1000Ω	470KΩ	†22Ω	48Ω	150Ω
V 6	35W4	4700Ω	Inf.	83Ω	112Ω	110Ω	110Ω	50KΩ	

† MEASURED FROM PIN 7 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.